

*The Automobile Club  
of America*

**Good Reading about Automobiles, Motors and  
Cycles, and the People who Make and Use Them**

**VOL. I**

**NEW SERIES**

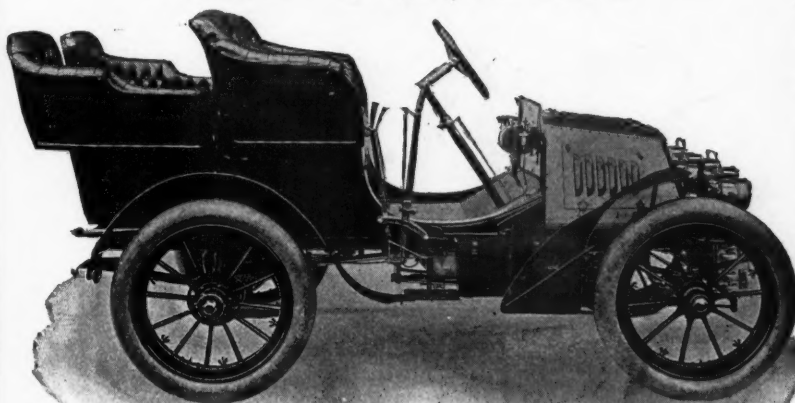
**No. 9**

# MOTOR AGE

**With Which is Incorporated  
THE CYCLE AGE**

**Subscriptions  
Domestic, \$2.00  
Foreign, \$4.00  
Single Copies,  
Five Cents**

**THE PEERLESS**



**The Peerless Mfg. Co., Cleveland, Ohio.  
SPACE D, CHICAGO SHOW**

**CHICAGO, FEBRUARY 27, 1902**

# Columbia Automobiles

ELECTRIC



GASOLINE

MARK XXXI ELBERON VICTORIA

This is our latest style of Victoria, and is the most stylish single seated vehicle as yet placed upon the market. It has a double motor equipment, and the weight of the battery is equalized on both front and rear axles which adds greatly to the ease in riding and advantage in hill climbing. Its radius on one charge of battery is 40 miles, and its maximum speed 13 miles an hour.

WRITE FOR 1902 ILLUSTRATED CATALOGUE AND PRICE LIST

**Electric Vehicle Co., Hartford, Conn.**

Western Agency and Show Rooms, 267 Wabash Ave., Chicago







# The Motor Age

A budget of good reading about Automobiles,  
Motors and Bicycles, and the people who make  
and use them.      \*      \*      \*      \*      \*

## PREPARATIONS FOR CHICAGO SHOW ARE COMPLETE

THE Chicago Automobile Show of 1902 is conducted under the auspices of the Chicago Automobile Club and the National Association of Automobile Manufacturers. The combination of interests represented is responsible for a desire to place before the people of Chicago and the entire west an annual exhibition which shall enable them to note the evolution of the automobile and shall permit the manufacturers to place before the people and the dealers one grand annual aggregation of the best the market affords—the finest, it is believed, so far as the present show is concerned, existing in the world.

Less than five years have elapsed since American manufacturers commenced to build automobiles commercially or in reasonably large numbers. Before that they had produced them in an experimental way and when, in 1895, the enterprise of the Chicago Herald led to the promotion of a competition between "horseless carriages" the principal question at issue was not how fast the machines could go, not how far they could go, not how easily they could be controlled, but whether they could go at all, and, among those which could, how many could go the circuit of the west side park system!

The year 1902 finds us with hundreds of carriages capable of traveling great distances, over some of the worst of roads. America has developed the steam carriage and brought it to a point of perfection which engineers of scores of years experience had said would be impossible. Even to clever mechanics an engine which can almost be placed in one's pocket, supplied with steam by a boiler scarcely larger than a good-sized pail, is simply a revelation. It is entirely the product of men who for the last five years have been striving—happily not in vain—to supply the world an instrument of locomotion of reasonable cost, reasonable size and almost unlimited capacity. Carriages of this class will be shown by a score or more of exhibitors and it may be accepted as a fact that nowhere else in the world has there ever been or would it be possible to assemble a finer demonstration of mechanical skill or examples of more perfect workmanship. In other words, there has been prepared for the Chicago public, an exhibi-

tion of which the equal has never before been seen.

Of electrical appliances America is the home. Recognition of that fact is worldwide. Hence all that has been stated concerning the exhibit of steam carriages is equally applicable to the electrics. The American electric carriage of to-day is the acme of comfort and simplicity. As a vehicle of recreation and utility it is employed in all parts of the world, and it is not an exaggeration to state that of all the electric carriages of the world 90 per cent are of American origin. Try as they may, the nations of Europe fall short of producing machines which can compete, in any direction, with those manufactured in the factories of American makers of steam and gasoline vehicles.

In numbers, gasoline carriages will excel. American manufacturers are giving greater attention to this branch of the industry than to others and therein greater progress has been made during the last twelve months than in any other. The impression has been created that American carriages of this type are inferior to those made abroad. This is due, largely, to the phenomenal performances made on the roads of France, but there are two things to be taken into consideration; first, the excellence of the highways, and second, that French makers have given particular attention to the production of high-powered vehicles for the use of the wealthier classes, while Americans, practical people that we are, have made commercial utility the first consideration. Durability, rather than speed, has been our aim, and in this matter our makers have been guided largely by the state of our country roads and other conditions to which European builders are strangers. On the floor of the Coliseum will be machines of unexcelled capacity under the same conditions as prevail abroad. They follow, in many respects, the foreign patterns and have entirely eliminated the "horseless carriage" appearance in favor of the up-to-date, business-like automobile.

As a road reformer the automobile will accomplish a great work. It is not generally known, perhaps, yet it is a fact, that the farmers of Illinois annually throw

\$100,000,000 into the mud holes which are dignified by the name of roads. In other words, good hard roads would enable the farmers to do away with so many horses, so much fodder, so many wagons, so many repairs, so many losses from inability to deliver goods at the time they would bring the best financial returns, that they would easily save the tremendous sum mentioned. Automobilists of to-day are, as a rule, men of progress, influence and means. It will be their endeavor to secure such improvements as will make it possible to drive their machines in any and every part of the country. The same considerations which are valuable to them, in this connection, will be even more valuable to the farmers and all other classes which have occasion to use the highways. And that, indirectly, means everybody. Practically every article of which we make use is affected, as to price, by the cost of transportation. The hundred millions of dollars which the farmers waste must come from the pockets of the people.

The present show is expected to mark the birth of one or more institutions whose principal aim will be to work in the direction of better highways. A call has been issued for a meeting of club delegates and another for a meeting of individual users of automobiles, to form a national association. The call for the first was issued by the Automobile Club of America, the foremost institution of its kind, the Long Island Automobile Club, the Boston Automobile Club, the Rhode Island Automobile Club and the Chicago Automobile Club. It will be held at the Coliseum during the week. The second will be a convention of the American Motor League.

For lovers of speed the best attraction possible in so limited space has been provided in the form of two racing machines, set side by side, on which rival machines may test their speed, which will be recorded on dials mounted above them.

Each individual exhibitor has endeavored to present a display which shall be a show in itself. As a whole the exhibit forms so grand a spectacle of its kind as has never before been seen on this continent.

#### **The Manufacturers' Association**

As the first annual automobile show at Madison Square Garden, New York, came to a close on November 10, 1900, about thirty manufacturers of automobiles and automobile supplies met and appointed an organization committee, the work of which resulted in the formation of a national association of automobile manufacturers.

The main object of this association is to protect the interests of the trade. This is done by regulating automobile exhibitions; fighting adverse legislation; promoting good roads; procuring the modification of the recent rulings of the United States Treasury Department in reference to transportation of gasoline vehicles on the waterways and by investigating the value of advertising mediums and such other matters as are of interest to members.

Without enumerating the considerable benefits already received by the members, it may be appropriate to mention that a great saving, to manufacturers, of time and

money has been the direct result of the association's work in limiting the number of automobile shows. By agreement of the members, only two exhibitions will be held each year; the spring show in Chicago, and the other at New York in the fall.

The present membership roll includes nearly all the principal automobile manufacturers in the United States, quite a large number of dealers, makers of automobile parts and accessories, and trade papers.

It is the desire of the executive committee that the association shall include the entire trade.

Active membership is open to manufacturers of complete automobiles, associate membership is open to manufacturers of anything connected with the business, dealers, sales agents and trade papers.

Active members pay a fee of \$25 for the first year and \$10 per year thereafter. The dues for associate members are \$15 for the first year and \$5 for each succeeding year.

The officers of the association are as follows:

President, Samuel T. Davis, Jr. (Locomobile Co. of America, New York).

First Vice-President, A. L. Riker (Electric Vehicle Co., Hartford, Conn.).

Second Vice-President, C. J. Field (DeDion-Bouton Motorette Co., Brooklyn, N. Y.).

Third Vice-President, Dane E. Rianhard (Overman Automobile Co., N. Y.).

Treasurer, Percy Owen (Winton Motor Carriage Co., Cleveland, O.).

Secretary, E. P. Wells (Steamobile Co. of America, Keene, N. H.).

Assistant Secretary, Harry Unwin (7 East Forty-second street, N. Y.).

Counsel, W. W. Niles (11 Wall street, N. Y.).

The executive committee is composed of fifteen members, whose names are given below:

Samuel T. Davis, Jr., Dane E. Rianhard, Chas. E. Duryea, A. L. Riker, W. C. Baker, H. Ward Leonard, Charles Clifton, J. Herbert Ballantine, John H. Flagler, John Brisben Walker, C. J. Field, E. P. Wells, J. Wesley Allison, Alexander Winton, J. W. Packard.

There are committees on legislation, transportation and exhibitions respectively.

Dealers and others who would benefit by membership in the association are cordially invited to make application. Blanks, which require the endorsement of two members in good standing, may be obtained of the assistant secretary at the association rooms in the Coliseum during the show, or at the offices of the association, No. 7 East Forty-second street, New York City.

#### **The Chicago Automobile Club**

The Chicago Automobile Club was formed, originally, under the name of the Western Automobile Association, on August 3, 1900. There were few owners of automobiles in Chicago at that time, but the few were enthusiasts. The membership during the first year or so of the club's existence probably did not exceed fifty, but club runs and other events were held, and when, a



few months later, a race meeting was projected at Washington Park the club accepted the responsibility and conducted the event with success. Early last spring the club held its first formal run of the season and secured the largest attendance, with one exception, ever seen in this city. The exception was an effort to demonstrate to the members of the city council the possibilities and ease of control of the automobile. One bright Saturday afternoon the city hall and county building were completely surrounded by machines, each ready to carry a city official to the scene of action at Douglas Park. It has been said that the mayor on that occasion was given the most exciting experience of his career. Seated alongside a daring chauffeur he was whirled up and down the boulevard at speeds ranging from 6 to 50 miles an hour, while admiring city fathers noted with interest the ease with which the car-

riages were started, controlled, stopped while traveling at tremendous speed and maneuvered generally.

The club planned a race meeting on a large scale in the fall but unfavorable weather conditions rendered its abandonment necessary. Its members, however, were reconciled by securing practically all the prizes offered at other race meetings within reasonable distance.

The present exhibition is the most pretentious with which the club has ever been connected, the event being at least equal to, if not in advance of, anything of the kind ever attempted in the United States.

The officers of the Chicago Automobile Club are as follows: President, F. C. Donald; vice-presidents, Charles Howard Tucker and Edwin F. Brown; secretary, Walter L. Githens; treasurer, F. X. Mudd; board of governors, J. E. Keith, Dr. Milton B. Pine, B. F. Schlesinger, W. D. Sargent, Harrison Musgrave, J. W. Bate, B. J. Arnold and S. A. Miles.

## SOME OF THE EVENTS OF CHICAGO SHOW WEEK

**A** NATIONAL association probably of automobile clubs only, leaving individuals to do as they please—will be formed at the Chicago Coliseum on Monday and Tuesday next. During the early days of the last week there was an exchange of courtesies between the president of the New York and Chicago clubs, each urging the other to issue the call, and eventually, on Friday last, Mr. Donald prepared and forwarded to every club a notice, in form as follows:

CHICAGO, Feb. 21.—Dear Sir: It being the consensus of the undersigned bodies that an interdependent federation of regularly organized and active automobile clubs of the United States is essential to the development, introduction and use of motor vehicles, after due consideration it was decided to unite in an invitation to all active clubs to be represented by two delegates each in a convention to be held in the rooms of the Chicago Automobile Club, Coliseum building, Chicago, March 3 and 4. The meeting will be called to order at 11 o'clock a. m., 3d proximo.

The contemplated premises for organization are, briefly, that all regularly constituted and active automobile clubs of acceptable repute be eligible to membership on an equitable basis of representation in all deliberative matters within the purview of the federation.

Conventions to be held annually in the east and west alternately.

An executive and other standing committees to be instituted. It is proposed that the executive body meet once each calendar month.

The practical objects which it is believed may be obtained by club co-operation are:

Enactments of liberal laws regulating the use of automobiles on public highways.

Protection of the legal rights of users of motor vehicles.

Improvements of public highways.

Development and introduction of the automobile.

Equitable regulation of automobile racing and trials of endurance and efficiency.

A medium for counsel and interchange of information, ideas and suggestions tending to the development and advancement of the art.

Delegate representation from your club is respectfully solicited.

The Central and Western passenger associations, comprising railroads operating in the middle western states and in the territory west of the Mississippi river to and including Cheyenne and Denver, respectively, will return delegates to the convention at rate of one-third of the fare paid for going passage, provided they request from the ticket agent at the time of purchasing tickets certificates indicating their intention of attending the meeting. Requests have been made for like concessions from the New England association, covering New England states; Trunk Line passenger committee, embracing railways operating in the states of Pennsylvania, Maryland, New York and New Jersey; and the Trans-Continental passenger association, covering territory between the Pacific coast and the 100th meridian.

You will in due course be advised in event of favorable action by the several passenger traffic organizations referred to.

If the project is favored by your club, kindly as promptly as practicable communicate the names of your delegates to Mr. F. C. Donald, President Chicago Automobile Club, Chicago, Ill. Yours very truly,

THE AUTOMOBILE CLUB OF AMERICA.  
THE PHILADELPHIA AUTOMOBILE CLUB.  
THE LONG ISLAND AUTOMOBILE CLUB.  
THE RHODE ISLAND AUTOMOBILE CLUB.  
CHICAGO AUTOMOBILE CLUB.







At a meeting of members of the Chicago club Friday evening President Donald and Vice-President Brown were elected delegates, with F. X. Mudd as alternate.

On Thursday the meeting of the American Motor League will occur and the indications are that, if held at a suitable hour, the attendance will be large. The association, apparently, will be left to represent the individual users of machines, regardless of club connections. Both sides argue that there is room for each and that there need be no conflict. Perhaps. We shall see. Others believe that the interests to be furthered would be benefited by an association of clubs and individuals, but to this the New York delegates, at least, will not listen.

During the show the Chicago Automobile Club will maintain headquarters in a comfortably fitted room on

the second floor of the Coliseum annex, where all visiting automobilists will be welcomed.

Tuesday evening the Chicago club will hold a smoker in the ball room, on the second floor of the annex. Invitations will be issued to visiting club men and others.

Thursday evening the club, the association and the management will give a smoker in honor of the visiting dealers. All dealers and exhibitors will receive invitations.

Five prizes will be offered for contests on the racing machines. One will be for the best time made during the week, irrespective of class; one for each of the three classes and one for club members only. These contests will be in charge of a committee of which F. X. Mudd is chairman. Mr. Mudd will be at the Coliseum during the greater part of the week and will supply entry blanks to all applicants.

## A FORECAST OF SOME OF THE PRINCIPAL EXHIBITS

IN keeping with its standing in the world of automobilism the Electric Vehicle Co. has taken a generous pace and will make an exhibit in all respects conforming thereto. The arrangements are in the hands of George H. Atkin, manager of the western department but he will have the assistance of a number of people

calling and other social functions. A long wheel base and flexible spring suspension insure ease of riding. It is built substantially, to withstand all forms of city and suburban usage. This carriage has a double motor equipment, with the steering rod, as well as the controller handle, on the left side, leaving a clear space in front of the seat. The controller gives three speeds forward and two backward. The battery is divided evenly on the front and rear axles. This arrangement, experience has shown, is the most advantageous in the operation of all vehicles. The body hangs particularly low, making it most easy of access to the passengers. The battery is of the Exide type, consisting of forty cells, and giving a radius of 40 miles on each charge, based on level asphalt or macadam. Speeds are given at the rates of 3½, 6 and 13 miles per hour.

The finish is as follows: Body panels in dark green; battery boxes and panel mouldings, black; gear, dark green, striped with black center and two fine lines of light green side stripes; upholstery in dark green leather; lamps, silver mounted; steering and other parts, nickel plated. If it is desired, and sufficient time is given,

the vehicle can be finished in any style other than standard. There will be furnished, if desired, as extras, a hood, meter illuminating lamp, dashboard watch, cyclometer and gradometer.



Mark XIII Elberon Victoria.

from the home office and factory. One of the features of the exhibit will be the Elberon victoria, mark XXXI, which is shown in the illustration. It is designed for light pleasure service and park riding, as well as for

The Foster Automobile Co.'s exhibit will contain a light roadster, one standard touring wagon, one four-passenger surrey and a heavy speed car, full descriptions of which will be furnished in the report next week.

#### Knox Automobile Company

The cut shows the combination two and four passenger carriage of the Knox Automobile Co., of Springfield, Mass. It is its latest and most popular produc-



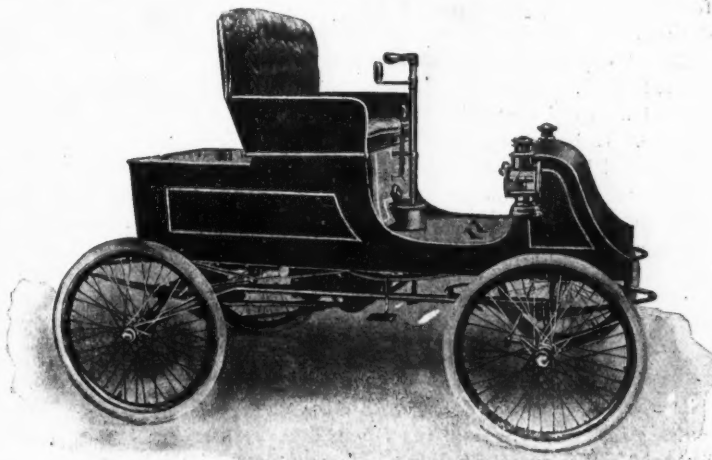
The Knox Combination Carriage.

tion and was designed to supply the demand for a strong, powerful, simple and neat-appearing single-seated vehicle, which can be easily fixed to carry four persons, by simply opening up the front seat. It also makes a desirable touring car on account of its long wheel base, large carrying spaces, and its extremely easy riding, due to its special spring construction. One of the best features is the cooling of the engine by the grooved pins and forced air system, which the company guarantees to give perfect results under all conditions. It is probably the only practical motor vehicle of its weight and power in the world, which operates successfully at all times without water. The long side springs, with their swiveled ends, insure flexibility and easy riding, and as all the mechanism is mounted on these springs, the wear and strain on it is slight. The carriage is driven by a single, horizontal cylinder, 8 horsepower, medium-speed gasoline engine, located in the front part of the body, and so arranged that it may be got at from all sides for inspection. The valves open directly into the head of the cylinder. The compression is high and in connection with the variable sparking arrangement insures the greatest power possible with this size cylin-

der, which is 5x7 in. The company guarantees that it will run the vehicle at a speed of 30 miles an hour, climb a 12 per cent grade at 12 miles an hour, and a 30 per cent grade on the low speed. Another feature is an emergency hand brake, operating on the rear axle and entirely independent of the two foot brakes. This will stop the vehicle in either direction. It is self-locking. There are large carrying spaces in both the front and rear of the body. Ten gallons of gasoline are carried, sufficient to run the vehicle 200 miles. The vehicle can be backed by pressing a pedal with the foot and the two forward speeds are obtained by moving the hand operating lever to the right or left. The engine and mechanism are mounted on an angle steel frame, to which the body is also bolted. The body can be removed by taking out four bolts.

The wheel base is 5 ft. 9 in. long; tread, 54 in.; tires, 30x3 in. on all four wheels; the rear axle is solid from hub to hub and made of nicked steel; the differential gearing is in one of the rear hubs; heavy roller chain drive; broad 10-inch leather mud guards; large 1½-inch double ball bearings on both front and rear axle; variable jump spark igniting system; eight cells, dry battery, four in use and four in reserve. A little device has also been attached whereby the engine may be positively started by a quarter turn of the starting handle. The main seat is very broad and has a high comfortable back with springs in both the cushion and back. The price, including mud guards, lamps, roller boot and odometer, is \$1,000 at present, but the company expects to increase this to \$1,100.

The Knox company will show two vehicles, one in the



The Latest Elmore Model.

regular finish and the other in red with black trimmings.

#### Elmore Manufacturing Company

In its new model 6 the Elmore Mfg. Co., of Clyde, O., offers several new features, while retaining all the desirable points of the 1901 carriage. As shown in the accompanying illustration, the body has a panel box forward which is free from all mechanism and is intended as a luggage carrier. The present body is longer than that on last year's model, the extra length being that added by the box. It is also set 2 inches further back on the running gear. The length of wheel base has been increased 6 inches. The seat is sufficiently wide for two persons and is upholstered in leather. The running gear is built entirely of seamless tubing and is strongly braced. It is fitted with 28-inch wheels, both front and rear, and with 2½-inch tires, having especially heavy treads. The spokes are 9-gauge and the hubs of extra length. The springs are of the well-known Concord type, and while sufficiently stiff to prevent a cradle-like motion when going over rough roads, are resilient enough to make riding comfortable. The standard finish for the running gear is red, while the body is usually finished in black.

The carriage is driven by a 2-cylinder gasoline engine with cylinders 4x4 inches and developing over 5-horse horsepower at 600 revolutions per minute. The throttle of this engine is its most unique feature. It is placed so as to throttle the mixture just before it enters the cylinder, and the response of the engine is said to be as prompt as a steam to variations in the throttle opening. The ignition device has but one moving part and is therefore of the simplest form imaginable. It is of the hammer break type and the electrodes are tipped with platinum. Current for the igniter is furnished by a dynamo and storage battery having sufficient capacity to run the engine several days. The engine may be started with either the battery or the dynamo. It is water-cooled throughout, circulation being insured by a rotary pump and the water cooled in a radiating tank under the front of the body. Power is transmitted from the engine to a countershaft by chains and sprockets. The countershaft contains all the variable speed mechanism, which is controlled by means of hand brakes, giving three speeds forward and one speed reverse. From the countershaft the rear axle is driven by means of a roller chain connecting to a sprocket on the differential.

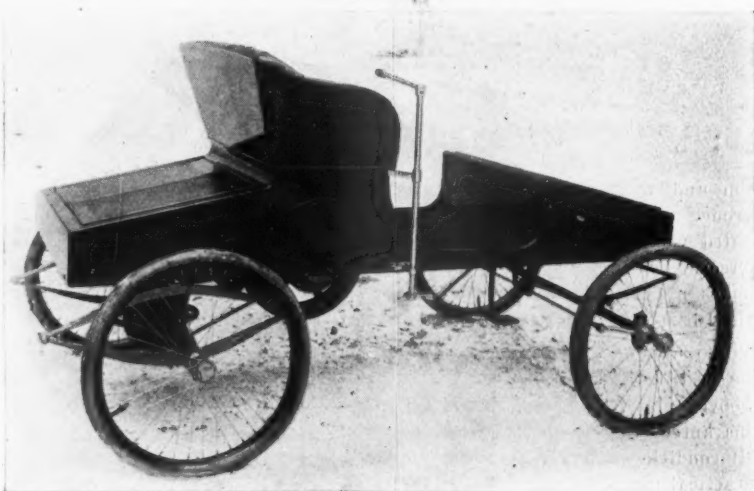
The vehicle is controlled from a vertical post in the center of the carriage and immediately in front of the seat. The top lever is for steering, while just beneath it is an arm for controlling the three forward speeds.

Beneath this arm and just behind the steering post is the throttle and the small wheel near the bottom of the carriage is that for the needle valve of the vaporizer. The outer foot lever is for controlling the brake on the differential, while the inner is for operating the reverse. The weight of the carriage is 1,000 pounds, between the two extremes, having sufficient weight to stand the strains, yet not heavy enough to be cumbersome. These vehicles may be found in the track space on the east side of the Coliseum and just north of the middle of the building.

The company announces that it has secured the services of E. W. Roberts, who lately resigned the editorship of the Gas Engine and gave up a promising engineering business to enter the employ of this concern as its mechanical engineer. Mr. Roberts is well known to many readers as a frequent contributor to the technical press and as the author of several books on the subject.

#### Buffalo Automobile and Auto-Bi Company

The Buffalo Automobile & Auto-Bi Co., which, last fall, succeeded to the motor cycle and vehicle business of the L. R. Thomas Motor Co., is offering a complete and attractive line both in automobiles and motor



The Buffalo Senior.

cycles. Of the former they have two models briefly described as follows:

Model 6, bearing the name Buffalo Junior, is a light runabout, weighing about 400 pounds, equipped with 3½ horse power water topped motor transmission with two speeds, wire wheels, steel rim and 2 inch motor tires, attractive design of body, spindle seat, handsomely upholstered, side steering and complete in every particular. The selling price is \$650.

Model 7, Buffalo Senior, is equipped with 6 horse power medium speed motor with improved transmission, two speeds and reverse operated by single lever; has a reachless gear with angle iron frame and is furnished with either ball bearing wire wheels or roller bearing

# STEEL RIMS

CRESCENT AND  
DROP CENTER

## SECTION

From 1 $\frac{1}{4}$   
inches up  
to 4 inches

## DIAMETER

From 28  
inches up  
to 5 feet

THE AUTOMOBILE AND CYCLE PARTS CO.  
SMITH STAMPINGS FACTORY  
MILWAUKEE, WIS.

1902  
Kelly Adjustable

# Handle Bars

STANDARD BARS OF THE WORLD



No. 3 Arms, Regular Stem.



No. 5 Side Arms,  
1 in. Forward Extension.



No. 4 Racing Arms,  
2 $\frac{1}{4}$  in. Forward Extension

It will pay all manufacturers these times when competition is hot, to see that their wheels are equipped with just the attachments demanded by the rider. Every rider knows the merits of KELLY BARS, as they have been for the past six years the most popular and foremost sundry in the cycle trade.

## THE KELLY HANDLE BAR CO.

CLEVELAND, OHIO, - - - - - U. S. A.



## WE CAN PERFECTLY SATISFY THE MOST CRITICAL

and completely fill all tire requisites as to safety and resiliency.

Our product in the past is the Best Evidence of our Success in producing goods of the Highest and most Reliable Quality.

## HARTFORD SINGLE TUBE TIRES and the Detachable DUNLOP TIRES

are universally acknowledged to be the Highest Grade Equipment,—and they always will be.

Since the first pair was made they have been used by the best makers, and by that class of users who desire THE BEST, and thus consider the question of their needs intelligently.

"Where there is lots of smoke there Must Be Some Fire." The talk you hear about these TIRES is not all "hot air." They have never had an off season. They have no bad reputation to live down.

**THEY ARE HONEST TIRES.**

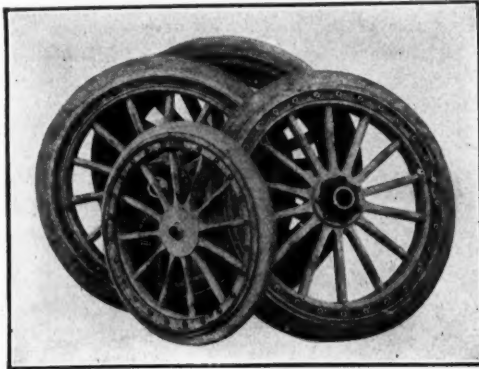
THE HARTFORD  
RUBBER WORKS CO.,  
HARTFORD, CONN., U. S. A.





wood wheels, 2½ inch motor tires, standard track, 6 ft. wheel base, is side steering and is equipped with a long body of attractive design, handsomely finished, high, full back and upholstered in leather. Price \$800, or with wood wheels and roller bearings \$850. This vehicle can be supplied with detachable tonneau, which is extra. Both of the above vehicles are equipped with motors manufactured by the E. R. Thomas Motor Co.

Not the least of the product of the Automobile & Auto-Bi. Co., is its motor cycle, known as the Auto-Bi,



Turner Endless Solid Tires.

which embraces three models in place of one offered last year and which lowered all previous records for 1 and 5 miles at the Pan-American Exposition. Model 3 has the same lines as the 1901 machine but embraces improvements suggested by experience. It is equipped with 1½ horse power motor, 1½ inch tandem tires and Morrow coaster brake.

Model 4 is diamond frame, 22½-inch, equipped with 2½ horsepower motor, large diameter of crank case, making it suitable for the narrowest tread bicycle; has drop forged fly wheels, single lever control for operating the exhaust lift, advancing and retarding spark and switch, all being done from the right hand grip. The upper tube of the bicycle is used as a reservoir for lubricating oil which is injected into the crank case by a small pump especially designed for this office; steel pulleys and both motor and rear wheel with belt that is practically non-slipping; mud guards front and rear; 1½ inch tandem tires; Morrow coaster brake and Kirkpatrick hammock saddle. Model 5 has the same specifications as model 4 with the exception that it has chain transmission instead of belt.

In addition to the above the company will supply attachable outfits to agents who desire to place them on special bicycles. It also continues to manufacture the favorite Auto-Tri and Quad, making them in three different models each, 2½ to 3½ horsepower for air or water cooled motors.

#### Hartford Rubber Works Company

The Hartford Rubber Works Co.'s stand will be arranged along the lines of the exhibit in the New York show. The space will be handsomely fitted and deco-

rated and will be lighted by two large electric signs. The exhibit will be in charge of S. E. Gillard, manager of the Chicago branch, and L. D. Parker, president. J. W. Gilson and W. H. Kirkpatrick from Hartford will be in attendance. The company will show a full line of goods which are accessory to the automobile industry, and which will consist of the various weights, sizes and styles of construction of Hartford single tube and Dunlop detachable tires. These have always been standards of their respective types for all that is best in tire construction, and they are better today than ever before. Solid and cushion tires, automobile mats and matting, rubber tubing, rubber vehicle springs and the Turner endless solid tire will also be shown. The latter, as a matter of fact, will be the specialty.

The great difficulty with solid tires mechanically fastened by wires and steel tapes has been at the splice. The rubber has to be compressed to make the splice. The result is that there is too much rubber for a given perimeter, the wires loosen or stretch, the rubber pushes away from the rim at the splice, the wires cut out, the tire creeps and the experience has been an exceedingly costly one, with not enough mileage to warrant the expense of equipping with solid tires that must be spliced. The Turner has its perimeter absolutely fixed by the endless wires shown in cut and in addition the tire is vulcanized in a mold, which insures, provided the wheel is correct, a perfect fit. The cut shows that the sides of the tire form a continuous angle. The flanges which bolt through the wood felloe are built with a corresponding angle and when bolted in place compress the tire to such an extent that creeping or pulling off is practically impossible. The weight of the vehicle assists in the compression of the tire, which insures against creeping.

#### The Haynes-Apperson Company

The Haynes-Apperson Co. will have their three latest designed model machines on exhibition—a four passenger surrey, two passenger standard and runabout. The four passenger surrey is especially designed for family use and touring. The seats are large and comfortable, and when traveling on a level road the jar is not much greater than a palace car. It was one of these machines which took first prize on Long Island for running one hundred miles without a stop during a rain and wind storm. The standard two passenger machine needs no introduction, as their record in the New York and Rochester endurance test speaks for itself. The runabout is the company's latest product and was gotten out to supply the demand for a lower priced and lighter machine. It is a duplicate of the standard, except in size, being about two-thirds as large. For short trips at a moderate rate of speed it is probably equal if not superior to any machine in its class. It has been very popular in the city of Chicago, where it seems to have supplied the want for a light business and pleasure carriage.

The following are some of the special features of the Haynes-Apperson machines: Their motor is a two-cylin-

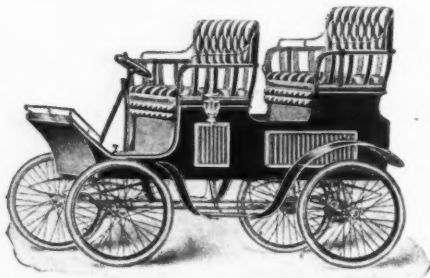
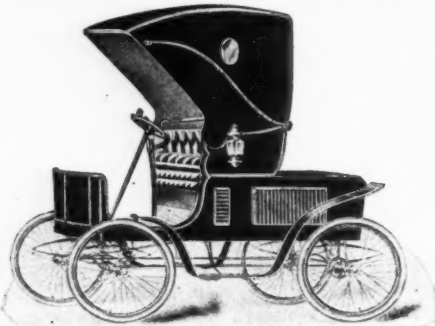
der engine, with the cylinders arranged in a horizontal position on either side of the crank-shaft, thus giving a balanced motion, to minimize vibration. It is the same design which has been used during the last 8 years and the company claims special merit in the following points: Perfect balance, steadiness of power, absence of odor, variation of speed, economy of fuel and simplicity in construction.

The make and break spark is used and the device for attaching the same is original and has always proven reliable. The first spark is furnished by dry cells, after which the current is transferred to the magneto-generator by means of a switch. The reliability of the sparking device has been of great importance in many races and endurance contests. Their machines have four speeds, all controlled by one lever, three forward and one reverse. The forward speeds are 6, 12 and 25 miles an hour. Haynes-Apperson carriages are all equipped with wood wheels, which have always been equal to the severest tests.

The company has made marked improvements along the following lines in the 1902 model: Water circulation, direct gearing, carbureter, clutch, geared lubricator and many other details.

#### Beardsley & Hubbs Manufacturing Company

The Beardsley & Hubbs Mfg. Co., of Shelby, O., which manufactures the Darling gasoline automobile, will exhibit the following styles, which are among its best selling machines: Style No. 1, stanhope, price \$950; style No. 3, combination two and four passenger, price \$1,100; styles Nos. 6 and 7, combination brake and delivery wagon, price \$1,500. In addition to the above styles it will exhibit a light touring car which has not yet been catalogued. It will be a very attractive

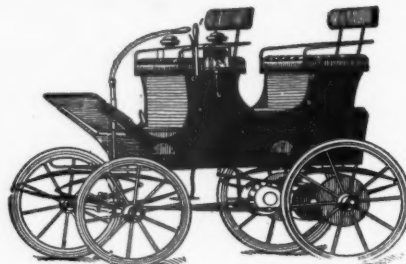


Two Styles of Darling Carriages.

machine. The Darling automobiles are equipped with a single cylinder, double acting engine of the company's own design, that will develop from 8 to 10 actual horsepower. The machines weigh from 1,200 to 1,800 pounds, and, considering weight, are among the most powerful machines on the market. The company has a number of strong patents on its machine and will show several special features found only in the Darling. The Chicago representative is J. Anderson Barton, of 6026 Ingleside avenue.

#### Buffalo Electric Carriage Company

The exhibit of the Buffalo Electric Carriage Co. will consist of three vehicles, as follows: Buffalo stanhope, in the wood and iron, showing the complete construction of the carriage, the special features of which are de-



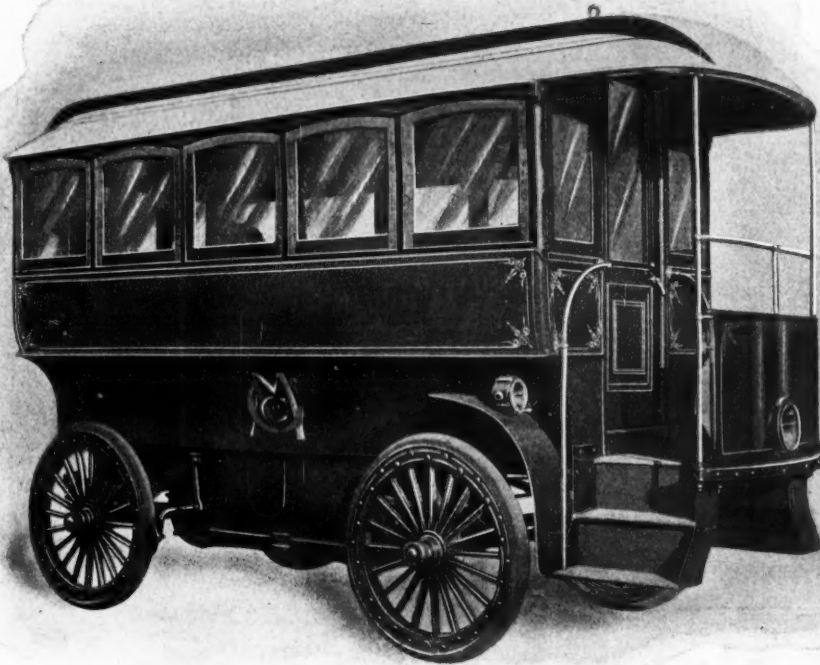
Buffalo Electrics for the Show.

sign of body (patent pending), design of running gear (patent pending), the use of hickory for the reaches; the whole being on the lines of the regular carriage construction. One Buffalo stanhope with victoria top, trimmed in green broadcloth; body and gear painted black, and striped with fine lines gold—a very rich-looking vehicle. One golf brake, with two seats, built very wide so as to carry comfortably six persons; upholstered in light Bedford cord; body panels painted black; seat panels and running gear in English coaching red; striped in black. The construction is the same as the stanhope. Their stanhopes and brakes have a maximum speed of 15 miles per hour, and will readily cover 50 miles on one charge of the battery, over good roads.

#### Ralph Temple Automobile Company

The display of this progressive house occupies nine spaces and comprises the exhibits of the Olds, National, U. S. Long Distance, Friedmont and White machines, for all of which Temple is the Chicago agent. The Olds company will show five machines, one with wood wheels,

## ***The Greatest Money - Maker In The World!***



### ***THE CHICAGO AUTO-COACH.***

Two sizes, carrying sixteen and twenty-two passengers. Abundantly powerful, strongly built, elegantly finished and upholstered, speedy, quiet and comfortable; heated by our patent hot water system. We also make all sizes and styles of Stanhopes, Coupes, Traps, Surreys, Brakes, Delivery Wagons, Freight Wagons, Hotel Busses and Coaches. If you wish to see the wagon which holds the World's Record for grade climbing (42.78 per cent) watch for our exhibit at Chicago, March 1 to 8,

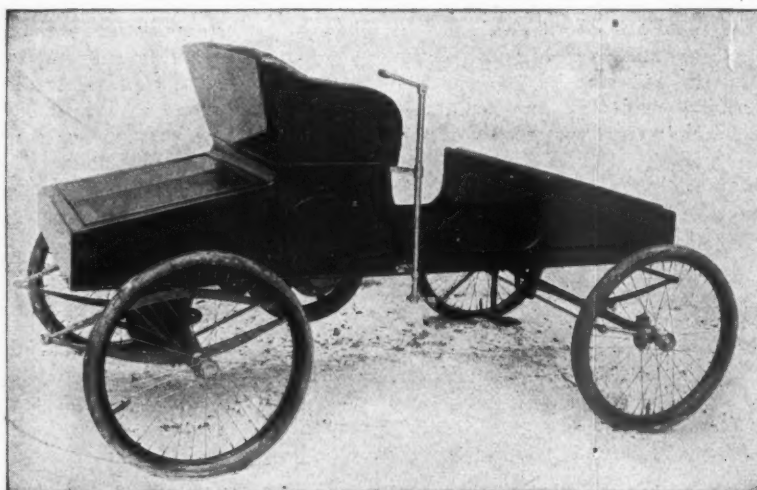
—WRITE FOR CATALOGUE—

**Chicago Motor Vehicle Company**  
326 Wabash Ave., Chicago, Ill.

Manufacturers of Unequalled HYDROCARBON Motor Vehicles.



# IS YOURS A BUFFALO?



MODEL NO. 7. BUFFALO SR.

## 2—AUTOMOBILES—2

No. 7. Buffalo Sr., with 6 h. p. medium speed motor.....\$800.00  
 No. 6. Buffalo Jr., with 3½ high speed motor..... 650.00

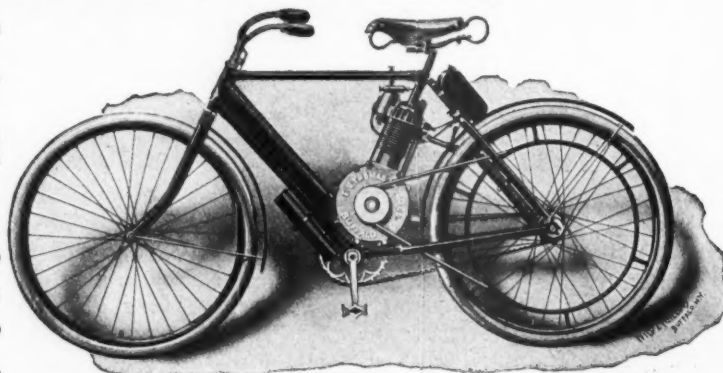
**ATTRACTIVE :: SIMPLE :: RELIABLE :: EFFICIENT**

See them at the Chicago Show. Send for Catalogue.

We refer you to more than 1000  
riders of our

**World's Record Auto Bi**  
3 Distinct Models

No. 3-1 ½ Motor .....\$150  
 No. 4-2 ½ Motor ..... 175  
 No. 5-2 ½ Motor ..... 200



MODEL NO. 5. RACER AND ROADSTER.

**TO AGENTS:** Exclusive Agency—Strongest Guarantee—Complete Protection—Liberal Proposition. We are the largest manufacturers of motor cycles in the world. We have passed the experimental stage. **WRITE US.**

**BUFFALO AUTOMOBILE & AUTO BI CO.,**

106 BROADWAY, BUFFALO, N. Y., U. S. A.

We use E. R. THOMAS MOTORS exclusively.

four with wire wheels and one with a top, one with dosados seat and one finished in bronze. The decorations of this space will be a combination of green and gold. The National Electric Vehicle Co.'s display will include eight machines, Stanhope, electrobile, road wagon and park trap, each in several finishes, with and without tops. The line of National vehicles shows a greater variety of runabouts and road wagons. An interesting display of parts will also be shown. The space will be elaborately decorated and brilliantly lighted, large palm trees and evergreens being profusely distributed.

The U. S. Long Distance Automobile Co. will show five handsome machines, all splendidly finished, and parts showing the principal features of the machine. This space will also be splendidly decorated. The office will be a bower of ferns and autumn leaves.

The White steam carriage display will include three machines, in a stand decorated in magenta and silver, with hot house plants in profusion. Included in the exhibit will be the celebrated engine and boiler, and as this is the first year the White machine has been shown in Chicago, this exhibit will be of great interest.

#### The P. J. Dasey Company

This company will show all kinds of automobile supplies for steam and gasoline machines and running gears, wheels, tires, etc., that can be used in electrics. The exhibit will contain gasoline motors ranging in size from 1 to 30 horsepower. The largest engine will be a four cylinder, 6½x8, having four throw forged crank shaft, providing for power impulse each half revolution of the shaft. The ignition is jump spark, Dasey plugs being used. The Buffalo four cylinder motor will also be shown. In double cylinder motors, the Brooks, Bren-

nan in three sizes, Dasey air cooled, Panhard type, and perhaps one or two others will be shown. Small motors of the air cooled variety will be the Holly, two sizes, Fleming and Dasey, ranging from 1½ to 3 horsepower. Marine motors in 1½, 6 and 18 horsepower will be shown, as well as the Clemick-Evinrude single cylinder automobile motor in operation, running Motsinger's Autosparkers. The Nieman single cylinder motor and transmission will be on view, the latter being a new product in which the motor and transmission are combined.

Neustadt new running gears will be shown for the first time. A display of Dietz oil lamps will form part of the exhibit, as will Franz tonneau and runabout bodies, Motsinger Autosparkers, steering devices in side, center and wheel steering varieties, the Apple igniting dynamo, Lunkenheimer specialties, float feed carbureters, etc. One of the interesting exhibits will be a new linkless, quick reverse, double cylinder steam engine, running in connection with a new type of flash boiler and Kelly generator and burner. The C. V. Dasey three cylinder steam engine will be shown, as will a new burner and pilot light made by the same concern. These engines are similar in many respects to the Serpollet.

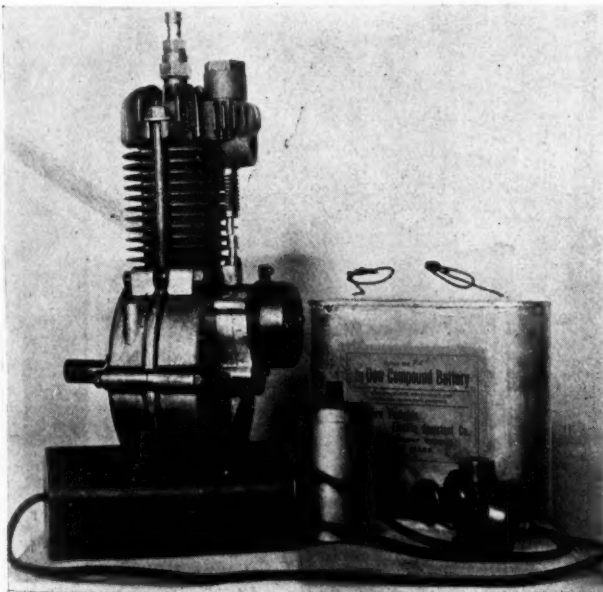
The principal exhibit will be the line manufactured by the Dow Portable Electric Co., comprising coils, batteries and spark plugs. In addition the new Dow mica plug in half inch pipe and metric threads will be shown. Vacuum tubes will be in operation, as was the case last year, these proving a very attractive feature, they being operated by Dow vibrator coils and batteries. Another feature will be the sparking of twelve plugs of different kinds by one coil. Those in attendance will be P. J. Dasey, Chas. S. Wilcox, W. H. Morrison, Prof. Barton, G. L. Marsh, C. P. Root and others.

#### T. B. Jeffery & Company

Thos. B. Jeffery & Co., of Kenosha, Wis., will have two samples of its Rambler vehicle on exhibition at Chicago. An illustration of this machine, and a complete description, appeared last week. The exhibit will be in charge of the sales manager, G. W. Bennett, but T. B. and Charles T. Jeffery will also be in attendance during the greater part of the time, and their hands will be open for shaking with all old friends and acquaintances. The firm will not attempt any lurid effects, believing that the quiet, restful but solid appearance of the exhibit will rest the weary limbs of many old friends as of old, and that the contented look that will spread over their faces after having examined the Rambler carriage will be one of the features of the show.

#### Merkel Manufacturing Company

At stand 38 there will be a number of motor-cycles on exhibition, as well as enough separate parts to give those who are interested a good idea of the design and workmanship that goes into the makeup of the Merkel motor-cycle. The company is not at all unwilling to show everything about the construction of its machine. The Merkel company is still young and is not



Dasey's Complete Outfit.



known to a great extent in the cycling and automobile world, but hopes to make a great many acquaintances at the show. J. F. and W. J. Merkel and Theo. Jonas will be at the show most of the week.

#### Badger Brass Company's Solar Lamps

Visitors at the Chicago show are assured of finding at space 40 the most complete assortment of acetylene sidelights and headlights manufactured by any one con-



Solar French Style Headlight.

cern in the world. It will be the exhibit of the Badger Brass Mfg. Co., of Kenosha, Wis., makers of Solar gas lamps for automobiles, carriages, cycles, boats, etc. When the fact is considered that more than 500,000 Solar lamps are in use by cycle riders in all parts of the globe, the statement sometimes made by automobile makers and drivers that acetylene gas lamps are too much trouble to take care of appears absurd, as surely the automobile owner of today has as much brains as the average cyclist. Education is but a matter of a few minutes' reading. In addition to the regular styles of automobile lamps, which include Solar, standard carriage, square carriage, baby square, automobile, automobile special headlight, finished in nickel, full brass and nickel and enamel, there will be shown new models of Solar French style headlights in two sizes, fitted with rubber gas bags, independent generators, and on which the gas can be turned down or entirely out. These lamps are fitted with parabolic reflectors, and as they burn one-half foot of gas per hour, the large size of the flame combined with the reflectors and lens project an intensely white field of light from 700 to 900 feet ahead of the driver.

#### K. Franklin Peterson

Stand 52 will be occupied by K. Franklin Peterson, who represents in western territory the well-known

Baldwin chain, Brown-Lipe gears, Midgley tubular wheels and American roller bearings. Representatives of all these houses will be present during the week. The American Roller Bearing Co. will show a full line of roller bearings of all sizes. This exhibit will also consist of a few sample wood wheels for automobiles; also rear axle casings fitted with bearings. M. F. and F. B. Hill from the home office will be in attendance during the show.

#### Automobile Equipment Company

This house will display the goods of a number of makers of parts and accessories, prominent among which are the Dayton Motor Vehicle Co.'s running gears, steam engines and boilers; Rochester Machine Tool Co.'s engines, and Dayton Electrical Mfg. Co.'s igniting dynamos. Representatives of all these concerns will be in attendance.

#### George N. Pierce Company's Motorette

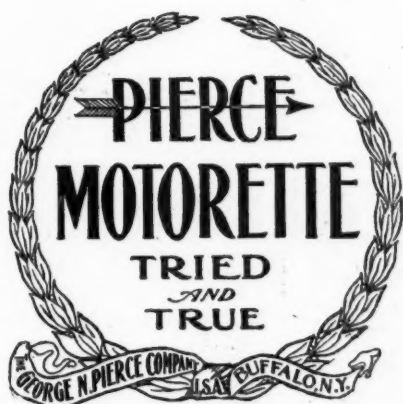
The management of the show announces with great regret the withdrawal of the George N. Pierce Co. on account of its inability to complete the new vehicles which it had expected to show. The Pierce people never do things by halves and preferred to withdraw entirely to making a display with which they would not be perfectly satisfied.

In designing the Pierce Motorette the object was the construction of a simple, light and strong vehicle of American design, based upon the best French experience. As a natural result the De Dion-Bouton motors have been adopted as being the best known designs in light powered motors. The transmission is a protected gear, direct transmission which might be designated as chainless as opposed to the chain driven vehicles. These gears are so arranged that when running on the high gear only the pinion on the engine crank shaft and the



The Pierce Runabout.

spur wheel on driving axle are in action, the power being transmitted through spur pinion compensating gear. All of the gears run in perfectly dust proof cases and in thick oil. The hill-climbing or slow gear is of the sun and planet type and is not in action when



3½ H. P. De DION MOTOR

## Runabout Type

Speed, 25 miles per hour.

## Unrivalled Climber.

An American design based on the best  
French Experience. Can be  
used all the year round.

**THE GEORGE N. PIERCE CO., Builders**  
BUFFALO NEW YORK DENVER

FOR SALE BY

Banker Bros. Co., Pittsburg and Philadelphia  
Automobile Headquarters, Boston

# Columbia Automatic Gas Lamp

For Motor Vehicles, Bicycles and Buggies.

Why Use a Large and Cumbersome Lamp When You Can Get Same Results With the Columbia for Less Money

NEW MODEL C COLUMBIA LAMP. Now ready for distribution. This Lamp is equipped with our new patent non-carbonizing burner.



Special Dash Bracket, which can be inserted in place of bicycle bracket.

Height, 5½ inches. Weight, 18 Ounces.

## FIVE THOUSAND OF THESE LAMPS IN USE

On Buggies, Carriages and Motor Vehicles in Chicago.

### EXCLUSIVE FEATURES

#### THE RESULT OF YEARS OF EXPERIENCE

Positive automatic water feed, i. e., the water feed is positively controlled by the gas pressure, which is regulated by a gas cock.

No carbide wasted. Charge can be used repeatedly until exhausted, the same as in an oil lamp.

Lights at once. Turns down or out at once.

Gas generated at low pressure, thus avoiding danger common to high pressure lamps.

Uses one-half the carbide necessary in a large lamp, and gives as good a headlight as the best.

Mechanism strong and mechanically correct.

Our Goods are Sold on Their Merits

We Do Not Offer Prizes

WE MAINTAIN PRICES. Jobbers who purchase from us can return all surplus of unused lamps, which are marked (Model C) to us at the end of the season.

Fine Art Calendar for 1902 mailed free to the trade on receipt of letter head and 5c in stamps.

Hine-Watt Mfg. Co., 60 Wabash Ave., Chicago, Ill.

running on the high gear. The motor and transmission mechanism are carried at the rear of the machine on a tubular steel underframe, so constructed that any distortion of same will not affect the alignment of the motor or gear, which are protected from road vibration by the front elliptical spring. The carriage body is hinged to the front of underframe and is carried on elliptic springs at the rear, relieving the body of the vibration of the motor.

The vehicle is steered by a lever from a center post between the two passengers and either of them may



The Pierce Runabout, with Top.

run the car. On the same center post are placed the speed, spark and gas levers. The slow speed gear can be used as a brake, in addition to which there is a powerful foot brake which will hold in either direction. Power is  $3\frac{1}{2}$  horsepower, with a gasoline capacity of upward of 100 miles and water capacity for upwards of 50 miles. The details of construction have been carefully thought out and the claim is made that it is the lightest, strongest and best constructed vehicle of its class on the market. Banker Bros. Co. of Pittsburgh and Philadelphia have the general agency for the state of Pennsylvania. The vehicle will also be found exhibited at Automobile Headquarters, Boston, at the company's store, 89 Chambers street, New York and 566 Main street, Buffalo.

#### Milwaukee Automobile Company

It has been whispered for some time past that at the Chicago show, the Milwaukee Automobile Co. would have a surprise in the way of a steam touring car, differing radically from all previous conceptions of the type. The company has been disappointed in being unable to exhibit it until the last two days of the show. The building of this carriage entailed so much extra work that in the present rush at the factory, it was necessary to sublet a part of the machine work and forging. Some of the most important of this went into the hands of the Pfeiffer & Smith Machine Co. of Milwaukee, and was in process there at the time of the fire, which destroyed the plant on February 21.

As it was impossible to obtain duplicates of the lost parts on short notice, the ruins were searched and the last of the forgings were unearthed late Saturday night. Determined to have the carriage on exhibit at any cost, the company has undertaken to re-temper the softened forgings and by dint of night and Sunday work have them machined and finished in time for exhibition of the complete machine by Friday, the day before the show closes.

This new machine which the company calls its Model KK is built with tonneau body, carrying four passengers, and there are individual seats in front for two more. It carries supplies sufficient for a 150-mile trip on ordinary roads without leaving the seat. In the design of this rig all precedent in steam vehicle construction has been disregarded. The boiler is of coil pattern slightly leaning toward the torpedo boat type. The engine is horizontal, driving direct into a gear containing a differential and varying shifts of gears. This construction enabling the vehicle to be easily converted from a touring car to a racing machine without change of sprockets. The rear wheels are independently driven. The rig will develop 25 actual horsepower, and is intended for an average speed of 30 miles an hour on good roads. The boiler is heated by kerosene stimulated by a forced draft, which is supplied with an auxiliary blower of latest design. The condenser will take care of all the exhaust steam, except under the most adverse circumstances, and even then the vehicle will run 125 miles on 40 gallons of water. The storage capacity is a full barrel of kerosene. The carriage is 11 ft. 6 in. over all, having a wheel base of 7 ft. 6 in., and the standard gauge of 4 ft. 8½ in.

#### Miscellaneous Exhibits

The Chicago Motor Vehicle Co. will, it is understood, be ready to show all but one of its vehicles. The list will include the coach described last week and shown at present in the company's advertisement. The space is one of the largest of the show. For the last two years, while the company has been pressing forward as rapidly as possible with its preparations for the market, the utmost interest has been shown by the trade in its goods, for while few had any great amount of information concerning them enough had been demonstrated at the Washington Park meeting to assure people that when the company was ready to do business it would be ready, also, to offer vehicles of a class for which business men have long waited. Hence the display of the Chicago Motor Vehicle Co. will attract as much attention as any in the building.

Details have already been given of the International Motor Car Co.'s exhibit—so far, that is, as the company has permitted. But little, as a matter of fact, has been given out as to the real thing. The company will expend no less than \$6,000 on the display. But mere extravagance will not count. The goods themselves will prove a revelation. This remark applies particularly to the new Toledo steam car, a drawing of which found its way, by accident, into the office of MOTOR AGE on



Monday. Little can be said about it at this time, except that it is totally unlike any other steam vehicle so far produced and is a typical automobile instead of a horseless carriage. The company's representative has been in Chicago for 10 days preparing for the exhibition.

Side by side, to the left of the main entrance, in spaces U, V and W, the Baker Motor Vehicle Co. and the Ohio Automobile Co. are expected to make one of the most creditable displays of the show. The local interests of the companies are in the hands of Pardee & Co., of 1406 Michigan avenue, who have been taking care of the preparations. Here we have a combination of three concerns of high grade, certain to supply something of value to themselves and interest to the buyer. The companies have not indulged in any advance promises, but the exhibits will be described fully next week. Pardee & Co. also represent the Crest.

The National Cement & Rubber Mfg. Co., of Akron, O., has just commenced to offer the trade the Happy Family group of oiline, cycle oil, rubber cement, plugging cement, Jiffoid cement, chainine and graphite. Half a dozen packages of each are put up in a neat case, which makes an attractive display. It is just the thing for a dealer who does not desire to carry a large stock, and is so handy to reach that scattered stock is out of the question. The National company will be glad to send an illustrated circular.

The Friedman company will be able to show only one of its new carriages. It had expected to have two on hand, but finds, at the last moment, that the factory will be unable to finish a second. Now that the early vehicles are ready, however, others will be pushed through at the rate of six a day. For that matter, the National Sewing Machine Co., which is making the vehicles, could turn out sixty with comparative ease, for it has one of the largest factories in the country.

The B. F. Goodrich Co. expects to exhibit its line of Goodrich single tube motor vehicle tires, clincher vehicle tires, automobile horns and collapsible rubber buckets. The clincher tire with Michelin fastenings is now used by practically all prominent manufacturers. The horns are furnished in two sizes, large and medium, of good material and neat in workmanship. The collapsible rubber bucket is practical and convenient to carry.

The New York Belting & Packing Co., Ltd., will show the New York long distance automobile and carriage tire, the round base and the new style flat base tire. The exhibition will be in charge of the Chicago store, of which John Mills is manager, and beside the western representatives, Messrs. Courtney and Poyen, of the eastern department, will be present.

The Twentieth Century Mfg. Co. promises a creditable exhibit, of course consisting mainly of lamps, bicycle, automobile and carriage hand lanterns, in three finishes, nickel plated, gun metal and burnished brass. David C. McLean will have charge of the exhibition, but F. E. Castle will be present, as usual.

The Fournier-Searchmont Co. has been reticent about

its exhibit. It is not, according to the gospel of Gash, to hide its light without good reason, and it is therefore assumed that the company will make a display not only of great magnitude but of merit. Searchmont vehicles are comparative strangers to Chicago people, and, indeed, to western people generally. The show is expected to change all that.

It is the Mobile company's intention to exhibit, especially, one wagonette, one heavy delivery wagon, one heavy surrey, one touring carriage, one light surrey, one runabout carriage, and as nearly as possible one of each class of its twenty different styles as shown by the catalogue.

#### All Going to the Show

The following is a partial list of the people who will be in attendance at some of the stands at the show:

Hartford Rubber Works Co., L. D. Parker, president; J. W. Wilson, sales manager; W. H. Kirkpatrick, special representative.

Veeder Mfg. Co., D. J. Post, treasurer and manager. Beardsley & Hubbs Mfg. Co., V. S. Beardsley, E. L. Sanderson, and S. F. Day.

Fournier-Searchmont Co., E. B. Gallaher, Henri Fournier, L. J. Sackett, W. D. Gash, C. M. Hamilton and A. P. Shumaker.

Spaulding Automobile & Motor Co., A. C. Hitchcock, Nelson P. Baker and Henry F. Spaulding.

Haynes-Apperson Co., Elwood Haynes, Frank Nutt and Heber Michener.

National Vehicle Co., C. E. Test, president; A. C. Newby, secretary and treasurer, and H. J. Hicks, manager.

Apperson Bros. Automobile Co., Hout Davis, Elmer Apperson and Edgar Apperson.

Thomas B. Jeffery & Co., Thomas B. Jeffery, C. T. Jeffery and George W. Bennett.

White Sewing Machine Co., Windsor T. White and Rollin C. White.

Olds Motor Works, Fred L. Smith, Roy D. Chapin, R. E. Olds and W. G. Morley.

Milwaukee Automobile Co., W. H. Starkweather, J. H. Dousman and J. A. Bechtel.

Ohio Automobile Co., George L. Weiss and J. W. Packard.

Baker Motor Vehicle Co., W. C. Baker and M. L. Goss. Twentieth Century Mfg. Co., F. E. Castle.

Elmore Mfg. Co., B. A. Becker and E. W. Roberts.

#### The Long Island Delegates

New York, February 24.—At its last meeting the Long Island Automobile Club voted to unite with various other clubs of the country in calling a committee to be held in Chicago early in March to consider the formation of a National Association of Automobile Clubs. Two delegates—viz., President William Wallace Grant and A. R. Pardington, a member of the board of governors—were chosen to represent the club. As alternates, L. R. Adams, former president, and F. G. Webb, treasurer, were named.



USE THE  
**Haynes-Apperson**  
**Automobile**

We have won every contest in which we have entered, with every machine used. Not one failure mars our record. This is not true of any other make in the world. All other makes that have won anything at all have had other machines fail in the same contests. These failures are as significant as their successes.

Both our machines in the New York-Buffalo run won first place, with fastest time of any machines built in America.

Long Island Test, 100 miles without a stop—won easily in a driving storm.

Two Track Races, Fort Erie and Detroit, won first place and Silver Cups, in faster time than the high power classes. All these machines were stock products, with no special features, and in no case required more care than any purchaser would give in ordinary pleasure riding or touring. :: ::



9 H. P. 36 In. Wheels. 2,000 Lbs. \$1,800.



9 H. P. 36 In. Wheels. 1,900 Lbs. \$1,500.

**Satisfied of this**, we spent last year enlarging our plant, and **demonstrating** the efficiency we had attained.

To-day the oldest auto-makers in the United States offer you the only perfected automobile in the world, backed by a record that is the envy of all competitors, at prices not "fancy," but based on the cost of economical construction.

These pictures show our vehicles in correct relative proportions.

We refer you to our record and our customers.

Our Catalogue Tells the Rest.

### **The Reason :**

We have built and sold Automobiles since 1893---nine years.

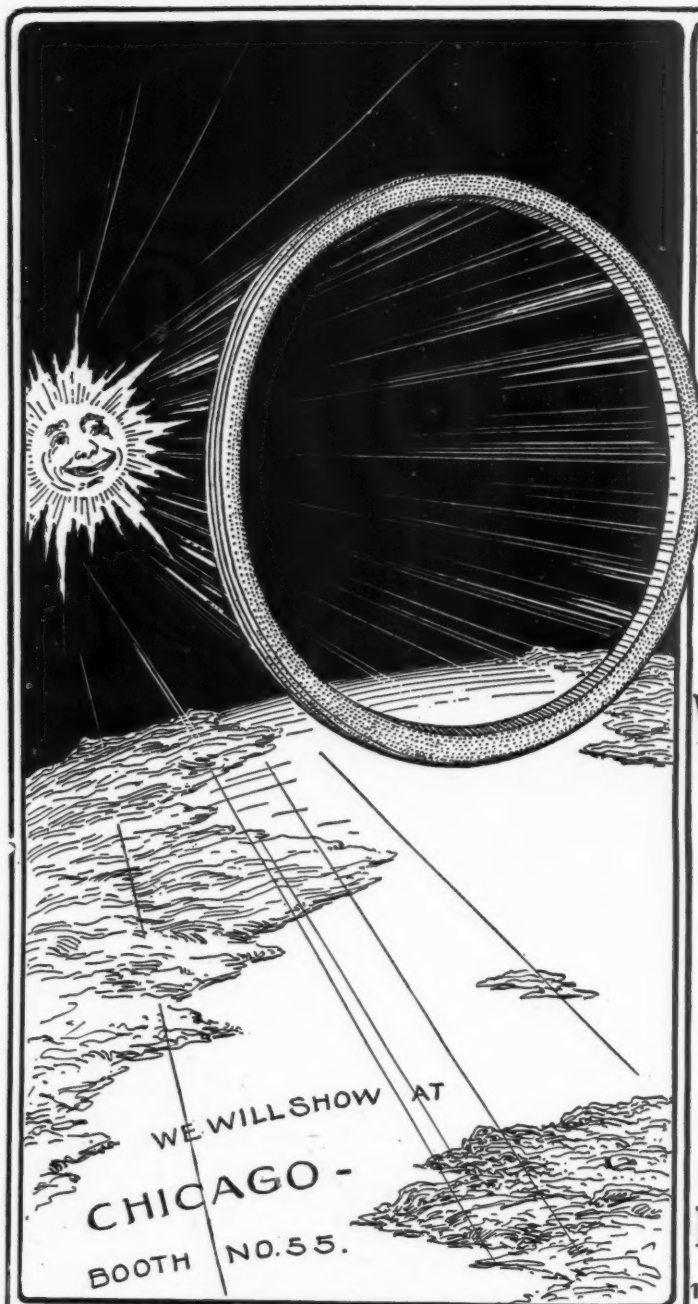
Five years ago we perfected our type, which has not since required change.

Five years have been spent in simplifying and strengthening our cars, until they are practically "fool proof."



6 H. P. 32 In. Wheels. 1,250 Lbs. \$1,200.

**Haynes-Apperson Co.**  
 KOKOMO, INDIANA



**G & J TIRE CO.**  
INDIANAPOLIS,  
INDIANA.

THE  
**SUN**  
NEVER  
SETS  
ON  
**G & J**  
**TIRES**

— • —

USED  
THE  
**WORLD**  
**OVER**  
SIMPLE,  
DURABLE,  
EASILY  
REPAIRED.  
THE BEST  
EQUIPMENT  
FOR THE BEST  
MACHINES

— • —

1902. CATALOGUES  
NOW READY.

MAKERS OF **G & J**  
DETACHABLE TIRES  
FOR  
ALL CLASSES  
OF  
VEHICLES.

## NEW YORK NEWS AND COMMENT

NEW YORK, Feb. 22.—As a result of the telegraphic and epistolary correspondence that has been constant and cordial between the Automobile Club of America and the Chicago Automobile Club this week and has been supplemented by the consent of the other clubs interested in co-operation the formal call for a convention was sent out yesterday signed by the Chicago, Rhode Island, Philadelphia, New York and Long Island clubs, the consent of the Massachusetts club not having been received in time to add its name, though its co-operation is assured. Chicago is, of course, the meeting place named and Monday and Tuesday, March 3 and 4, the dates designated.

President Charles E. Duryea has also sent out a call for a convention of his American Motor League for March 6, at the show. As an independent proposition the A. M. L. is not regarded seriously here, the opinion being that at present active automobile interest and influence are more centered in the clubs. MOTOR AGE's original suggestion that the new association combine club and individual membership along L. A. W. lines has met with approval at this end from the start and the idea seems to prevail that the Chicago convention will form the new association along these lines. The suggestion has been made that the American Motor League join forces with the clubmen at Chicago, the argument being that such a merger would prevent the existence of two rival bodies at a time when a union of all automobilists is necessary for effective work.

It looks now as though before the week closes the speed bill will have been passed at Albany with about all the objectionable features complained of by the automobilists obliterated. To be sure, Senator Cocks got the country speed limit reduced to fifteen miles an hour; but his outrageous \$500 fine or one year's imprisonment was reduced to \$50 for the first offence, and for the second \$50 fine or six months imprisonment. The Automobile Club of America has furnished the sinews of war and put up the whole fight alone. It deserves all the credit and is getting it ungrudgingly. Backed by a national association, the battle could have been fought much more effectively and with the expenses much more justly distributed.

The automobilists, cyclists and horsemen have met with much actual success and a great deal of encouragement in their fight for local highway improvement of every kind. Their efforts have been given wide publicity and at Thursday evening's meeting letters from a score of driving, automobile, cycling, riding, truckmen's, stablemen's and other highway using associations were received promising co-operation. A rather unwise attempt to have lower Broadway asphalted is their only probable failure.

The fraternity established among the various classes of vehicle users is shown in the traffic ordinance just

introduced by Alderman Oatman, an enthusiastic cyclist and alliance man, which after discussion received the unanimous approval of all classes at Thursday's meeting. The limits set were ten miles an hour for bicycles, motor vehicles and street cars; 8 miles an hour for passenger and pleasure vehicles drawn by horses; and 5 miles an hour for all others.

The Automobile Club of America's efforts to get for users of motor vehicles the same privileges in crossing the Canadian borders as are enjoyed by the cyclists have failed. The Dominion officials promptly consented to reciprocity, but the authorities at Washington declined, for reasons the following letter, from O. L. Spaulding, assistant secretary of the treasury department, to the president of the Automobile Club of America, will explain:

"The department is in receipt of your letter, in which you ask that some arrangement may be entered into by which automobiles owned by members of your club and others may be taken to Canada and returned without the assessment of duty under the existing tariff law, as in the case of bicycles belonging to members of the League of American Wheelmen.

"In reply I have to state that the department has given due consideration to the matter, and has reached the conclusion that it would not be feasible or consistent with the interests of the revenue to promulgate regulations looking to the free entry of automobiles of foreign origin belonging to members of foreign or domestic clubs, as in the case of bicycles, passing to and fro between Canada and the United States, and Europe and the United States. Your inquiry is, therefore, answered in the negative.

"I may state, however, that under the regulations of this department of May 7, 1887 (T. D. 8225), it is prescribed that duty shall not attach to teams and vehicles of well-known parties passing the frontier and remaining for a period not exceeding three days, and no objection is perceived to the application of these regulations to automobiles generally, so far as frontiers are concerned.

"Under the law and the regulations of the department automobiles of domestic origin taken abroad and returned to the United States are free of duty."

Some thirty automobile owners are now at Lakewood, the near-by winter resort, and have their vehicles with them. Prominent among them are George Gould, Albert C. Bostwick and George F. Chamberlin. A substantial brick storage station, known as the Lakewood Automobile House, has been erected and its promoter is reaping a just reward for his foresight and enterprise. The roads through the pines are fine. The motor vehicle owners, by the way, have made themselves popular by consenting to keep off the lake drive, which is somewhat narrow and largely used by drivers and equestrians.

## Automobile Show at the Crystal Palace

LONDON, Feb. 22.—The Automobile show at the Crystal Palace is a wonderful improvement on last year's exhibition, particularly in vehicles of British manufacture. The Daily Telegraph says: "The exhibition demonstrates that Great Britain has now little to learn from foreign manufacturers, if she has not some lessons to teach." It is noticed that most of the machinery

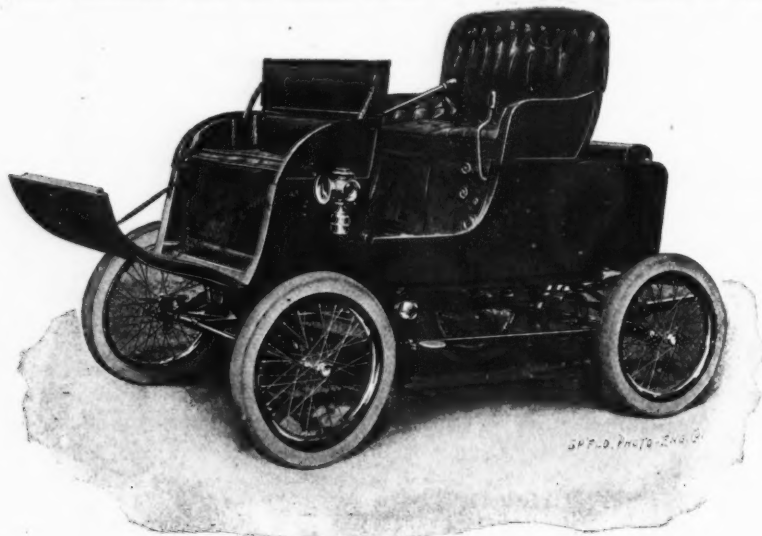
used on the English machines is made under foreign patents, but the workmanship is English, and the resulting improvement is most marked. Such are the cars shown in the admirable display at the Crystal Palace by the Motor Power Co., whose Napier may compare on every point with any at home or abroad.

So the vehicles of the Star company, the Motor Car Co., Messrs. Bradbury or the Ariel Motor Co. will bear inspection both as regards shapeliness and mechanism. Steam, electric and petroleum cars are all worthily represented, among the exhibiting firms being the British Electromobile Co., De Dion-Bouton, Clement, Darraq-Farman, Automobile Agency, the Gladiator company, Panhard & Levassor, Haycraft and the Pick Motor Co.

A very interesting and significant section of the exhibition is that devoted to motor bicycles. Almost every form of the possible variations which this machine has reached in the course of its development is represented. The grounds of the Crystal Palace offer exceptional opportunities for demonstrating the running of the cars and cycles of to-day. A series of races for motor cycles will be held on the track on Wednesday, and Mr. Van Hooydonk will endeavor to cover 200 miles without a stop on a Phoenix motor bicycle.

#### Charles J. Moore's New Company

The C. J. Moore Mfg. Co. of Westfield, Mass., has been incorporated with capital of \$35,000, for the manufacture of Westfield automobiles and parts. The gentleman whose name the company bears was for many years associated with the famous Lozier establishment



The Moore Carriage

of Cleveland and was later general superintendent of the American Bicycle Co.'s works. Mr. Moore will be president of the new company and associated with him are James Noble, Jr., vice president, and John M. Sauter, treasurer, the three constituting the board of directors.

About three months ago Mr. Moore began getting together a plant for general production of automobile

parts, and occupies two or three buildings in Birge avenue, well stocked with modern machinery and employing about forty men. Finding imperative the need of larger and more convenient quarters and increased capital he decided to form a chartered company and associated with himself Messrs. Noble and Sauter. Every part of the machine is made in the factory. Five models will be put in the market, ranging in price from \$1,000 to \$1,800, and each fitted for use for pleasure or business purposes. Instead of using the ordinary pneumatic tires the machine will be equipped with mechanical tires having a core of steel springs and a steel rim with leather cushions, the whole thing being covered with rubber, making a most durable and most easy riding tire. Automobiles of the A and B models are completed and will be shown at Chicago. President Moore and Treasurer Sauter will be in Chicago during the exhibition to exploit their machine. The company expects during the coming summer to erect in the vicinity of the bicycle works a factory of mill construction 50x200 feet, in which all the work can be done under one roof.

#### Prizes for Essays on Good Roads

Through the good roads department of the Tri-Weekly Tribune of New York the American Cycle Mfg. Co. offers the following prizes to pupils in high schools:

First—Two hundred dollars in cash for the best five hundred word essay on the subject, "The Necessity of State Legislation for Good Roads."

Second—A \$75 Columbia or Cleveland bicycle.

Third—A \$50 Cleveland or Tribune bicycle.

Fourth—A \$35 Rambler or Crescent bicycle.

Fifth—A \$25 Monarch or Imperial bicycle.

Each wheel will be fitted with a Twentieth Century gas or oil lamp and a New Departure coaster brake, bell and cyclometer and Hartford single tube tires. Ten additional New Departure coaster brakes and six Twentieth Century lamps will be given as prizes by the New Departure Mfg. Co. and the Twentieth Century Mfg. Co.

Each contestant must be a pupil of a high school in the United States.

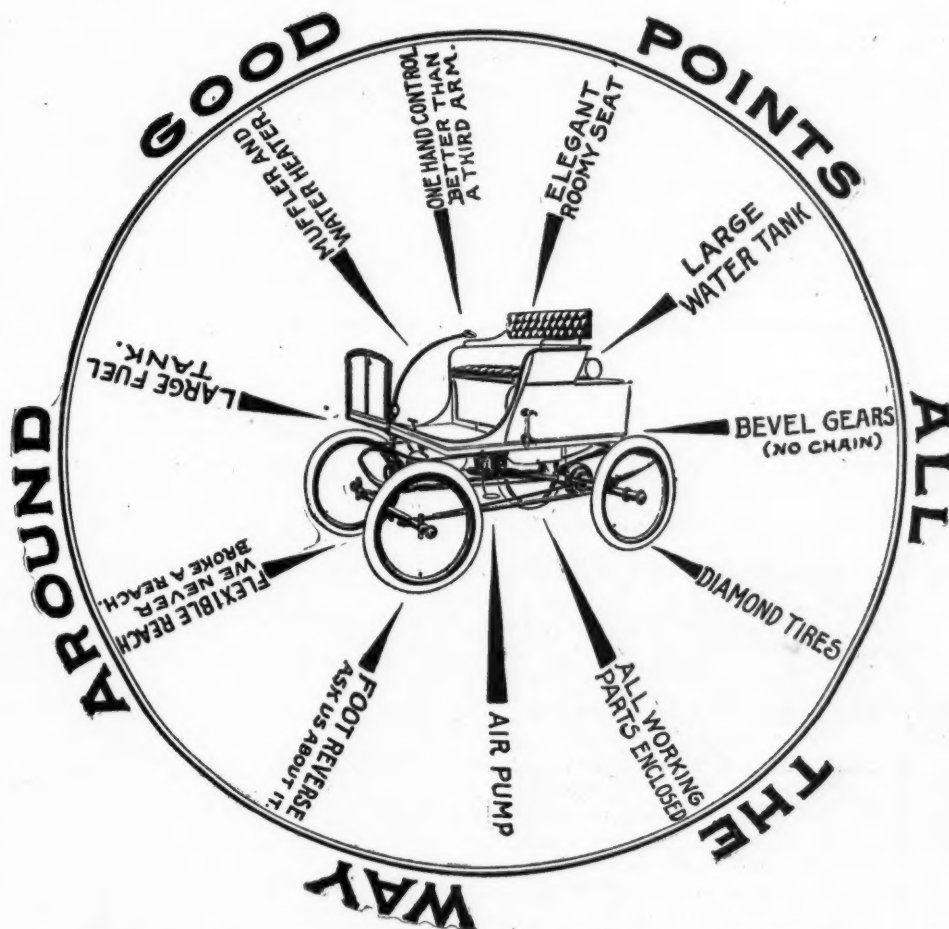
Each essay must bear pupil's name, age, parent's or guardian's name, and the attesting signature of the teacher or principal of the school.

Each contestant, or a member of each contestant's family, must be a subscriber to the Tri-Weekly Tribune; the essay must bear the name of the subscriber in addition to that of the author.

Contest closes at midnight, May 1, 1902. The result will be announced and prizes awarded as soon thereafter as possible, not later than June 1.



# THE Century



**CENTURY MOTOR VEHICLE COMPANY**  
**SYRACUSE, N. Y.**

If you do not see us at the show call on us at Syracuse or write us about your requirements. : : : : : : :

## Two High Class Automobiles

For Delivery Purposes.

**Equipped with new Porter Batteries.** One 5 h. p. and one 4 h. p.; double set of tires and fenders for each. Brilliantly lighted and decorated and suitable for any line of business. Only slightly used, and now in first class condition. One or both will be sold at a great bargain; also a brand new first class Stanhope, can be equipped with any kind of power—cost me \$700; will take \$300. Also one double compound engine with steam and air gauges, water glass, column try-cocks, safety valves, air and water pumps, boiler, burner and regulator complete, lubricator, 30 feet of Baldwin chain, water and gasoline tanks, steam condensers, exhaust pump, steam chime whistle, automatic fire regulator and injector, metallic flexible steam pipe and connections; in fact, a complete outfit for a steam launch or automobile. Will sell separately if desired at sacrifice prices, namely, \$250.

**RUPPERT**  
THE SHOEMAKER

166 E. Harrison St., - - - CHICAGO

## STEAM CARRIAGE PATENT DEVELOPMENTS

One of the Large Concerns Reported to Have Acknowledged Their Validity—Summary of the Whitney Claims and Patent Specification Drawings.

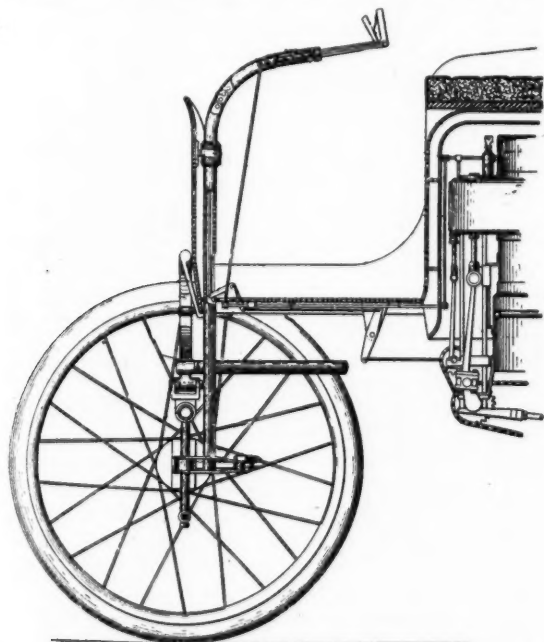
NEW YORK, Feb. 20.—J. A. Kingman, of the Locomobile Co. of America, told your correspondent to-day of an important surrender in the steam vehicle patent litigation now being pushed by his company. "The Mobile Co. of America," said he, "has come in and acknowledged their validity and paid upward of \$100,000 in royalty. As you can easily see, this is a very important bit of news to all makers of steam vehicles whose basic principles are covered by the Stanley and Whitney patents. The Stanley brothers, whose patents we bought, have attempted to resume making steam vehicles along the same lines and this is the foundation of our suit against them. The Mobile Company, whose president was originally interested in the Locomobile Company, had the right to build vehicles under the Stanley, but not under the Whitney, patents. Before our company bought these patents they were subjected to thorough expert investigation. We would not have purchased them had we not been sure they would hold in law."

The Whitney patents referred to relate to vehicles wherein the motive power is carried by the vehicle itself, and while the mechanism described is applicable to a vehicle propelled by any kind of mechanical power, the patent relates particularly to vehicles in which steam or other expansible power is employed. The aim is to

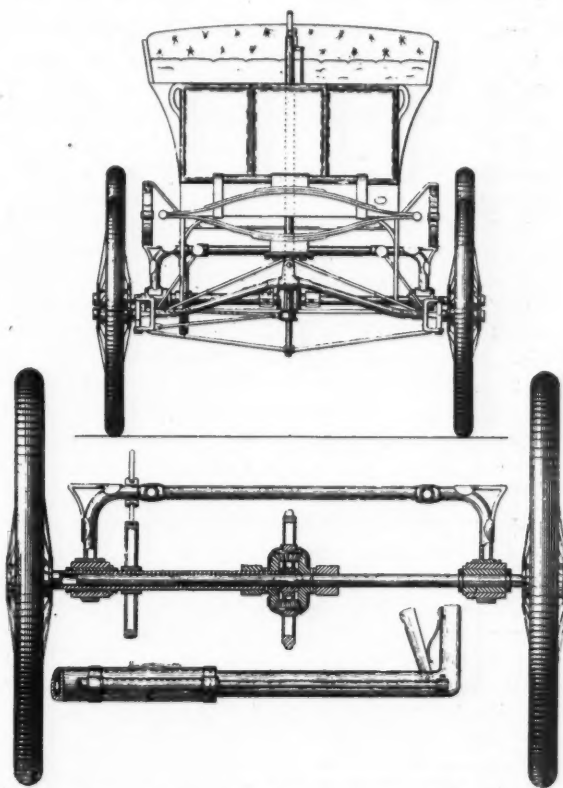
provide, among other things, great flexibility, compactness, lightness, perfect control and simplicity and ease of operation.

The running gear is of somewhat similar type to those now used except that instead of the top brace over each axle being arched, the rear one is straight along the top and curves downward at the ends, ending in lugs that carry the bearings for the rear axle. At the bends in the top braces are two triangular pieces, used for spring rests. The specification covers a rear axle, rotatively mounted in bearing blocks, with compensating gear, one gear wheel of which is attached to the solid shaft and the other to a sleeve that revolves around the solid shaft, one rear wheel being attached to the outer end of each. Attention is called to the added strength of this construction, although no claim is made of his particular part. Brace rods running from the ends of the running gear axle ends to the reaches are also specified, as is a band brake attached to the sleeve which forms part of the rear axle.

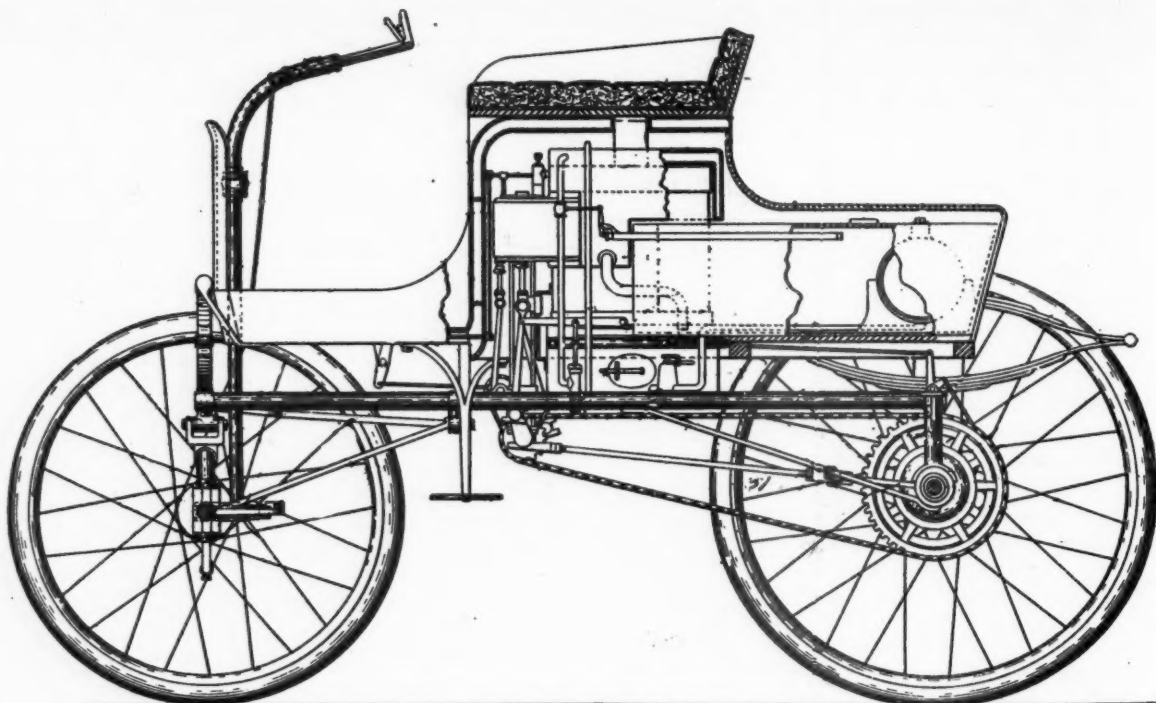
The front axle is composed of one tube of arched pattern, carrying a lug at the apex, which carries the king bolt. Under the arch are tie rods running from each axle end, from, which, running to the apex of the arch, is a support, the construction thus formed being braced, yet light. The wheels are rotatably mounted on steering knuckles or spindles and attached to the steering lever by means of connecting rods. Attention is



The Whitney Patent—Controlling mechanism, showing steering handle, with which is included the reverse and throttle.



The Whitney Patent—Running gear, front and rear view, showing method of mounting body on front axle to allow free movement of wheels on uneven surfaces.



THE WHITNEY PATENT—SIDE ELEVATION, SHOWING GENERAL CONSTRUCTION, WITH PARTICULAR REFERENCE TO THE DISTANCE ROD AND GENERAL ARRANGEMENT OF ENGINE, BOILER AND WATER FEED TANKS.

called to the angle of the arms on the knuckles which, by being placed at a certain angle, allow the wheels to be so turned that the circle or path of each will be in accordance with the turn being made, the inner wheel necessarily having to move in a smaller circle than the outer wheel.

Stress is laid on the construction of the running gear, which allows of the movement of the wheels up or down according to the surface of the road, without straining the frame, a feature which is claimed to give longer life to the running gear and wearing parts than would be possible should the frame be more rigidly constructed and no allowance be made for such movements. Reference is made to the mounting of a boiler, with engine attached to one side, under the seat, the steam chests and cylinders being jacketed, but for particulars, reference is made to patent No. 601,218, granted March 22, 1898. While the patent relates more particularly to steam, it is said to be "obvious that a gas or other motor may be used without departing from the spirit and scope of my invention."

It will be seen that the intention of the patentee was to cover all forms of motor vehicles in which the propelling power is carried in the body, the latter being mounted on springs and power being transmitted to the rear axle by chain or otherwise, and distance maintained between the driving and driven shafts by means of distance rods.

Another feature on which great stress is laid is the arrangement of the throttle or engine controller combined with the steering lever. As this feature is in-

cluded in about one-half of the claims, which number no less than forty-six, this part of the patent appears to be regarded as of great value.

The steering is accomplished as is usual where center steer is used, and the reverse by pushing the handle in or out of the steering handle. The throttle is actuated by a small lever carried on the grip, this being turned either to the right or left as desired. According to the claims of the inventor this feature is broadly new.

The motor and boiler are carried on an iron frame designed to fit around the boiler, the frame being bolted to the body frame in such manner as to allow of its being shoved forward or backward in order to take up slack in the chain. Provision is made for maintaining the distance between the driving and driven shafts by means of a distance rod, which is adjustable in length, this feature being another which seems to be regarded as of great importance and for which claims are made in a number of different combinations. Provision is made for passing a current of air between the seat and the engine and boiler to prevent the seat from becoming heated. A feed water heater is also provided, this surrounding the upper part of the boiler and extending over the top of same.

The gasoline or fuel tank is carried in the water tank and is almost completely submerged, thereby placing the supply of oil as far as possible from the heat of the fire box. Provision is made for a hand pump for filling the boiler after the latter has been blown off, so arranged that water may be taken from a tank or creek



**"OUR ADMIRATION IS GENERALLY  
GIVEN,= NOT TO THE MAN**

who does what nobody else attempts to do, but to that man  
who does BEST what multitudes do well." *Macauley.*

This holds the secret of our continuous and healthy growth; it accounts for our prestige as makers of good tires.

**HARTFORD SINGLE TUBE TIRES  
AND THE DETACHABLE  
DUNLOP TIRES**

Are the Original Pneumatic Tires  
of their Respective Types.

THEY WERE BEST YEARS AGO,  
THEY ARE BETTER TO-DAY..

The maintaining of their high quality throughout these many years, and our unceasing efforts in the direction of improving them wherever possible, has placed these tires far in the lead of all competitors.

Imitations may come and go, but  
"Hartford's" and  
"Dunlop's"  
Live on Forever in Popular Favor.

QUALITY TELLS  
IN THE LONG RUN.

Manufactured by  
**THE  
HARTFORD  
RUBBER  
WORKS  
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HARTFORD, CONN.,  
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**THE BEST LINE OF**  
**2nd Hand Machines**  
**IN AMERICA**  
**"GOOD MACHINES ONLY."**

**A. L. DYKE,**  
 Manufacturer  
 Linmar Bldg.  
 St. Louis, - Mo.

28x2 1/2  
 PNEUMATIC  
 TIRES  
 \$39.00 set  
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**DYKE'S FLOAT FEED  
 CARBURETER, \$15.00**

The first float Feed Carbureter placed on the American market. Everything ready to attach. Lever for controlling the speeds.

**ORIGINAL PRICE, \$20.00**



**Dyke's Mixing Valve**

A good Valve, used in place of Carbureter. Will vary speed, but not as effectively as Carbureter.

Price, suitable for sizes 1 to 8 h. p. .... **\$3.50**

**Dyke's Circulating Pumps**

Cast Iron, with BRASS shaft..... **\$7.50**  
 Full Brass..... **8.75**



**Dyke's Radiating Outfits, Complete**

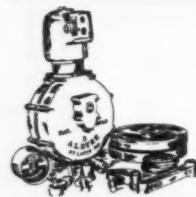
Made up of eight copper tubes 24 inches long, with 2-inch square copper discs—double row, placed 4 in a row with studs ready to hang. Measures 26 inches long, 9 inches high, 5 inches wide over all. The neatest affair in the market.

Price..... **\$30.00**

**Dyke's Wheel Steering Device**

Consisting of Alumnoid leather-covered Wheel, Steering Rod, bearing supporting rod, Bronze Quadrant with fork ready to attach. Can be fastened to any machine. Rod 3/8-inch, any length. Wheel, 11 inches.

Price..... **\$16.00**



**WE SELL CASTINGS**

**Or any part of our No. 0 Engine,  
 In the Rough or Machined. . . .**

The Cylinder and Head, you know, is all of one casting. It bores to 4 inches and 4-inch stroke. We have had quite a demand alone for these cylinders. We also sell a cylinder of the same type which will bore 5 1/4 x 6

**WE MANUFACTURE**  
**GASOLINE ENGINES FROM 3 1-2 TO 10 H. P.**

**Our Catalogue will tell the rest.**

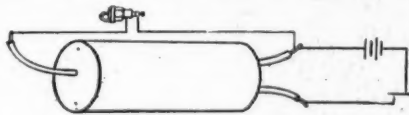


as desired. Forced draught is provided for, both before starting and after steam has been raised.

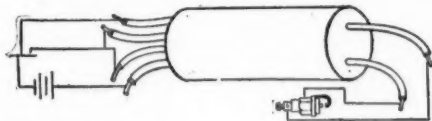
These notes covering the points embodied in the specifications are only in general form, but furnish a fairly adequate idea of the claims on which the patent litigation now pending is based. A careful perusal of the patents and reference to the drawings are of course necessary to a thorough appreciation of the patent in its relation to the development of the steam vehicle industry to date. The number of the patent is 652,941, granted July 3, 1900, to George E. Whitney.

### The Williams Sparking Devices

The jump spark coils manufactured by E. Q. Williams of Syracuse, N. Y., are different from any others on the market as there is no paraffine nor paper used in their construction, except what paper is used in the condenser. Instead of following the usual construction and winding the wire in layers, separated by sheets of paper, which method brings half of the potential of the coil within a space of about one-quarter of an inch. These coils are wound in sections, using the best insulated wire, and are then put through a process which



is designed to remove every particle of air from the coil and replace it with a special compound which is much superior to paraffine. By mounting the coils in this manner the potential of the secondary is separated by the extreme length of the coil, thus reducing the danger of a break down to a minimum. The condensers are passed through the same process as the coils, and when complete are as firm and solid as a board. The connections are soldered, so that there is no danger of their coming loose. The binding posts are fastened on the inside by machine screws and provided with spurs in such a way that it is impossible for them to become loose or turn around. On vibrator coils, the lock nut on the contact screw is dispensed with and a clamping device used which can be adjusted to allow the contact screw to turn easily or which will hold it as rigidly as though in a vise. The

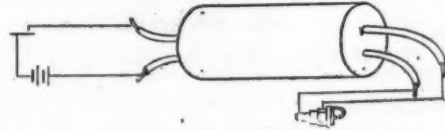


vibrator has no screw or lock nut but is provided with a rocking piece which sets against the wood and is held by the screws which pass through the wood and are held by the nuts on the inside of the box. No dependence is placed on the woodwork to hold the screws. The vibrator is provided with extra connections so that in case it is desired to dispense with the vibrator it can be done very easily by drawing back the contact

screw carrying the leads from the two connections to the break on the engine.

The bicycle or style E coils are put up in hard fibre tubes with fibre ends. These are made in exactly the same manner as the others and passed through the same process.

The make and break, or style M coils, are arranged for the touch-spark and passed through very much the



same process as the jump spark coils and are waterproof and practically indestructible. While they are only 8 inches long, they are said to contain more material than the ordinary 10-inch spark coils, and will work with little current, and give a large spark. This style, as well as all the others, is provided with binding posts or flexible wire leads as wanted.

### American Automobiles Gone Abroad

WASHINGTON, D. C., Feb. 19.—Exports from New York for the week just ended show something of a falling off in nearly all lines when compared with those of the previous week, but Germany still continues a good weekly customer in the line of bicycles, her total take for the week amounting to something over, \$25,000, while Dutch patrons bought to the tune of \$6,000 and more. To other countries as follows: Abo, material, \$280; Amsterdam, \$4,169; material, \$1,905; British West Indies, \$580; British Guiana, material, \$339; material, \$30; British East Indies, bicycles and material, \$1,862; Bremen, material, \$616; \$30; British Australia, material, \$75; Central America, velocipedes, \$10; Copenhagen, sporting goods, \$50; material, \$1,796; Christiania, material, \$389; China, bicycles and material, \$300; Dutch Guiana, \$36; Dutch East Indies, \$1,499; Ecuador, \$28; Frankfort, material, \$126; Genoa, \$25; material, \$2,328; Hong Kong, material, \$149; Hamburg, \$24,060; material, \$1,209; \$1,652; Havre, material, \$1,125; bicycles, \$2,500; Japan, material, \$823; Landserona, material, \$251; London, \$342; bicycles and material, \$1,161; Liverpool, \$885; material, \$715; Milan, material, \$400; Malta, material, \$15; New Zealand, \$1,160; Nuremburg, material, \$124; Philippine Islands, cycles and material, \$520; Peru, \$75; Rotterdam, material, \$1,700; bicycles, \$1,202; velocipedes, \$22; Siam, \$75; Southampton, \$70; material, \$2,737; Stockholm, material, \$653; St. Petersburg, material, \$2,029; Swansea, \$25; U. S. Colombia, \$30; Uruguay, \$380; Warburg, material, \$398.

### Hill Climbing Extraordinary

At the Indianapolis show, held Feb. 17 to 22, considerable interest was aroused in the automobile hill climbing contest. This took place upon an incline inside the building, following the wall for a distance of about 160 feet, rising at a grade of from 19 to 25 per cent. In

order to give the machines a severe test portions of the incline were built at a sharper angle than others. During the week most of the machines exhibited made the climb, and the ease with which the National Electrobile, model 50, went up caused its makers to decide that the machine was capable of carrying considerable more of a load than two passengers.

On Saturday evening, the last night of the show, five men were placed on the machine and with this load it started for the top. To the spectators it looked as if the machine made as good time with its overload of two and one-half times its usual number of passengers as it did with the ordinary load. After reaching the top the machine descended to a point below, where a 22 per cent

he had just seen thoroughly convinced him that the National was the machine for his use.

#### New Jersey Automobile Company's Station

The New Jersey Automobile Co. will occupy a new building at 226-228-230 Halsey street, Newark, an asphalted street on the main line between New York and Philadelphia, and expects to have one of the most complete automobile plants in the country. The plans call for over 16,000 square feet of floor surface, and the building will be divided into show, storage, sales, reception, reading and assembling rooms, offices and private office. The repair shop will cover some 1,200 square feet. The company will run its own electric light plant and



THE INCLINE AT THE INDIANAPOLIS SHOW.

grade commenced; the operator stopped and reversed and went up the incline backward, thus showing the complete control of the machine under extraordinary circumstances. He then descended to the floor and four additional men were taken aboard, making a load of nine men, and with this bunch of humanity the machine was whirled round and round the floor of the building. The power by which this was accomplished was a 2-horsepower motor which developed about 10 horsepower.

This feat caused prolonged applause and immediately after this part of the exhibit the booth of the National Vehicle Co. was thronged with interested parties. One of them, a prominent physician, immediately closed his order with the Hearsey Vehicle Co., local agents, for a National Electrobile, making the statement that the test

will be in a position to charge six electric carriages at once. The New Jersey Automobile Co. carries the Autocar, Locomobile, Baker, Spaulding and Thomas.

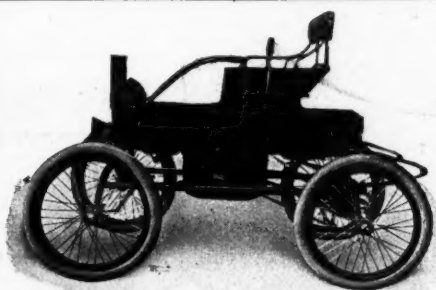
#### Columbia Automatic Gas Lamps

The Hine-Watt Co. is so well known to the trade that it needs little introduction. Its Columbia automatic gas lamp for 1902 retains all the desirable features of the lamps of former years and has the following exclusive features which have won favor at the hands of the trade after years of continuous service. The water feed is positively controlled by the gas pressure, which is regulated by a gas cock; there is, therefore, no waste of carbide and the charge can be used



# THE BAKER

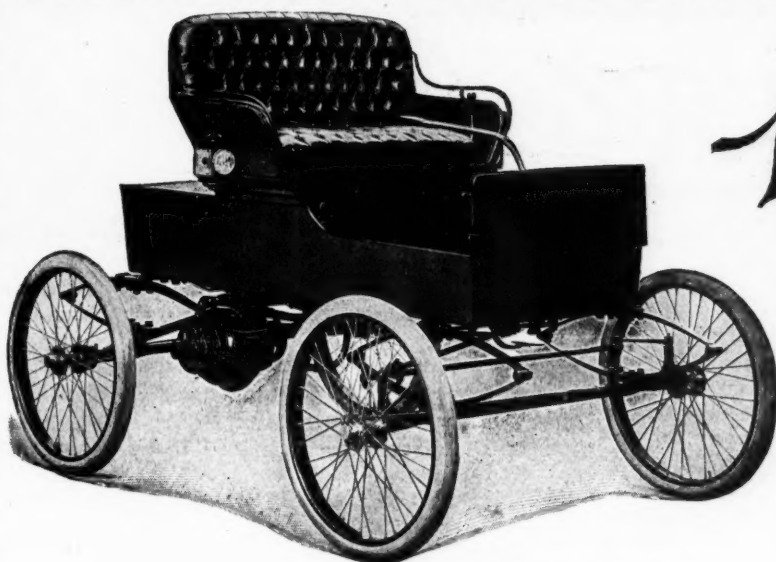
IF IT'S A BAKER IT'S THE BEST  
The Most Efficient of all Electric Vehicles



THE LIGHTEST WEIGHT  
THE STRONGEST MADE  
THE BEST FINISHED



We will send you a Catalogue, or we will write you. Address  
The Baker Motor Vehicle Co.,  
CLEVELAND, OHIO



*Waverley*

ELECTRIC  
CARRIAGES

... ARE ...

"ALWAYS READY"  
EASY RIDING  
ECONOMICAL TO  
OPERATE AND  
NOISELESS WHEN  
RUNNING : : :

WAVERLEY DEPARTMENT

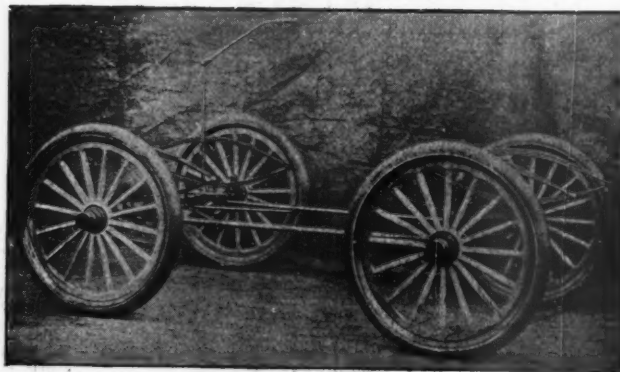
INTERNATIONAL MOTOR CAR COMPANY

INDIANAPOLIS

INDIANA

# AUTOMOBILE RUNNING GEARS

Get a Running Gear that is Past the Experimental Stage and Build a **SUCCESSFUL AUTOMOBILE**



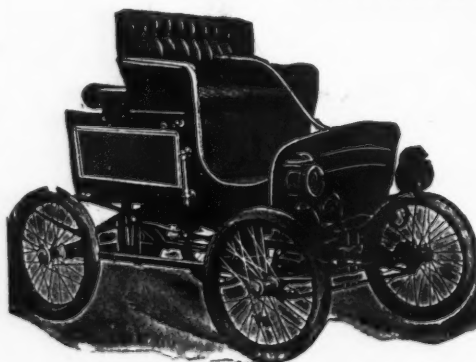
We Make Two Styles Complete With Springs and Wood Wheels, Solid Rubber or Pneumatic Tires :

...OUR SPRING BLOCK BEARING IS SELF-ADJUSTING ...

and you ought to have it. It is made for revolving axles and is pivoted between the bearing and spring block, enabling the bearing to move free and easy with the axle always. Our catalogue tells all about it

**THE BRECHT AUTOMOBILE CO. 1201 CASS AVE., ST. LOUIS, MO.**

*"Toledo"*



The burner of a "Toledo" Steam Carriage is of most improved pattern.

An air injector tube renders the combustion as perfect as possible, thus insuring very quick steaming.

A small reliable pilot light that burns irrespective of the automatic regulator facilitates firing.

The automatic fuel regulator controls the action of the burner according to the demands of the engine.

The fact that the burner is built in our own shops of the best procurable material guarantees its construction and manufacture.

**International Motor Car Co.**

**TOLEDO, OHIO**

NEW YORK BRANCH: 91 FIFTH AVENUE.

repeatedly until exhausted. It lights at once and can be turned down just as an oil lamp can, or out altogether, as desired. Gas is generated at low pressure, thus avoiding the danger common to high pressure lamps. The makers assert that it uses but half the charge used in ordinary lamps and gives as good a head



light as the best. The mechanism is strong and mechanically correct. The Hine-Watt Mfg. Co., 60 Wabash avenue, Chicago, is the manufacturer and makes the liberal offer to the trade, that all lamps left over at the end of the season in the hands of the jobbers may be returned. By no conceivable means would it be possible to more thoroughly demonstrate the faith of the makers in their product.

#### Dyke's 6-Horse Power Tonneau

The illustration shows a side view of Dyke's new 6-horsepower tonneau, assembled. The features of this machine were described in an earlier issue. The engine cylinder and head are in one casting and water cooled. Transmission is by direct connection with the engine shaft. The transmission is encased and the change

gears and bevels run in oil. The running gear is of Dyke's flexible reachless type. Further details may be obtained of A. L. Dyke, Linnar building, St. Louis.

#### Securing Capital in California

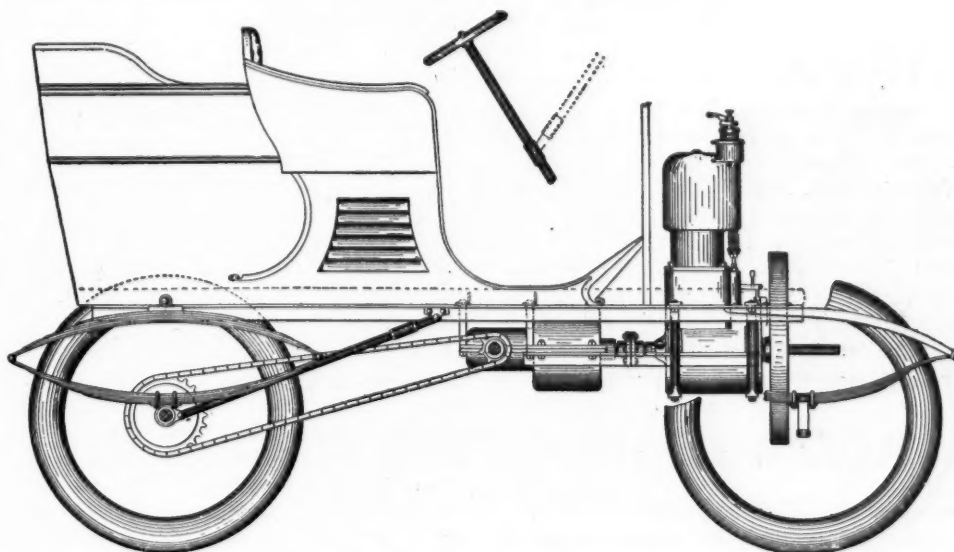
The Christman Motor Carriage Co., of San Jose, Cal., is seeking stock subscriptions of \$10,000 from citizens. Dr. John W. Davy, chairman of an investigating committee, has made the following report:

"It is a local concern doing business with local capital under one management. The carriage appears to work smoothly and satisfactorily. J. L. Pendleton, manager, showed that they were proceeding along conservative lines. We are informed by the company that they have definite assurance of financial support from outside sources, but it is their desire to remain here and to establish a factory to employ from thirty to fifty skilled workmen. This they estimate may be done if they can add to their present capital by the sale of stock to the extent of \$10,000. We venture to suggest that the Improvement Club shall, by the acceptance of this report, express its good will towards this particular industry and the hope that the investigation of its claims on the interesting public may lead to its building up of a business that will be a credit to our community."

The report was adopted unanimously.

WASHINGTON, D. C., Feb. 19.—The following were the exports of motor vehicles, etc., from New York for the week just ended: Bremen, motor vehicles and parts, \$250; London, motor vehicles, \$660; Mexico, auto-vehicles, \$1,095.

Colonel E. H. R. Green, of the Texas Midland railroad, has announced that he will establish an automobile passenger delivery system in connection with trains at Ennis, Terrell and Paris, Tex.



SIDE VIEW DYKE'S NEW 6-HORSEPOWER TONNEAU.

## QUESTIONS AND ANSWERS

GREENVILLE, Tex., Feb. 18.—Editor MOTOR AGE: Is there any advantage to be gained by constructing a gasoline motor so that the compression may be automatically increased or diminished as the engine's speed is increased or decreased? If so, what is gained and should compression be greatest at high speed or low speed? In getting more compression, I mean to do it by automatically making the piston clearance less between two opposed pistons.

In using wipe spark ignition, is it necessary to govern time of exhaust as well as the spark? If so, why, and at what time should the discharge take place?

Have there been any double piston, single cylinder motors patented except the one recently described as using the Scotch yoke?

Are there any gasoline engines built that are balanced well enough to run without being bolted to anything?—Yours, etc., T. H. STRUNK.

1. The only thing gained by constructing a motor in which the compression could be raised or lowered would be the regulation of speed, but as it would complicate construction it would be of no advantage, for the same results can be obtained more simply. In the method mentioned the fuel consumption would not be as economical as if a standard type of construction and a float feed carbureter were used and the speed of the motor were regulated by a throttle valve between the carbureter and the intake valve, or for that matter by shifting the time of ignition. If compression be raised the power and speed of the engine will be increased. An engine with given bore and stroke can be made ineffective for certain work by too low compression, and if the compression be raised it will perform its work satisfactorily. The secret of the power derived from small motors, and large ones, too, for that matter, is merely having high compression. Compression will always be greater at high than low speed, for the time consumed in making the stroke is so short that even if there be a small amount of leakage the compression cannot lessen to any appreciable extent because of the rapidity with which the stroke is made, whereas, should the speed be low, more time is given for leakage. In a properly constructed engine, however, the leakage is small, and with proper lubrication the compression should be maintained at about the same figure under normal conditions.

2. The use of the mechanical spark for ignition purposes has nothing to do with the regulation of the exhaust. Each is a separate feature and can be made to operate early or late according to the desire of the builder. The ignition can be made variable, and it is advisable to make it so, even though it may not be used in regulating the speed, when other attachments are provided for that purpose. The variable ignition allows the spark to be timed so late that back explosions are prevented, whereas if the ignition is set stationary—and that point should be just before the end of the compression stroke is reached, in order to develop

the highest power—it is likely to cause back explosion when the engine is started slowly, this being the case especially in the hands of the inexperienced. Sufficient momentum to carry the cranks over the center would have to be imparted to the flywheel to prevent the above mentioned result. The governing of the exhaust is a matter of little concern provided a variable spark and mixture throttle are used, for the two latter features will provide the means for regulating. If, however, they are omitted, an exhaust governor can be used with good results, it being so arranged that when slow speed of the motor is desired, the exhaust valves may be thrown out of operation for a certain number of revolutions and automatically thrown into operation after the speed of the motor has decreased to the point at which the governor is set to throw the valves again into use. If it is not desired to make the governor automatic, regulation can be done by hand the same as with a throttle, the lever being placed at the side of the seat of the operator the same as the other controlling levers. The time of discharge of the exhaust should be from a fraction of an inch before the piston reaches the end of the explosion stroke until the piston returns to the end of the exhaust stroke, but care must be taken that the valves operate perfectly, else they may close a little too early or late and the efficiency of the motor will thereby be reduced accordingly.

3. There is no engine being commercially made that uses two pistons in one cylinder, so far as MOTOR AGE is informed.

4. There are a number of opposed cylinder engines that run with so little vibration that they may be operated on a block without bolting and still be safe, but they would transmit no power for working without being fastened. The one thing in favor of such a motor is the absence of vibration, which is, of course, desirable. This type of motor is becoming more prominent in the automobile industry every year. If it is this correspondent's desire to regulate the speed of the engine by the exhaust, jump spark ignition will be found more serviceable owing to the heat generated being higher than that of the primary spark. This allows of a greater margin of surety of operation.

### For Dogs and Fourth of July

Wadsworth, O., Feb. 20.—Editor MOTOR AGE: I must compliment you on obtaining experiences of amateur motor drivers. My experience has been like many others, the little causes generally are the hardest to find. I have a 4½ horsepower gasoline, water cooled, machine, and my many little troubles have all been caused by not knowing my engine thoroughly and while experimenting to learn it. I have held several post-mortem examinations and by this time think I could make a machine to duplicate this one, and I'm still learning. I have added a few appliances to my machine. One is to open the exhaust so it will not pass into the muffler. I find this device the finest thing for dogs of the "team chasing" kind; also it gives increased power by allowing a clean supply of gas in the cylinder.



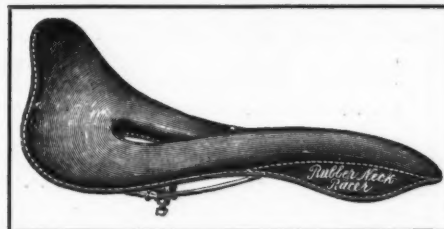
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Double Cylinder Vertical Motor forward. Detachable Tonneau.

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A light Car for two people. Vertical Motor forward.

When purchasing Automobiles there are three essentials to be considered: Motive power, construction, and manufacturers' responsibility. We invite investigation.

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I have it arranged to open or close with a small lever or throttle at side of driver and it need not be used except when wanted. It furnishes a fine representation when in use of a Fourth of July celebration, or a gatling gun in action. If any one would like the plan of mine I will be glad to furnish same.

As I have the first machine in the county, my greatest experiences have been in meeting or passing teams; more especially when the amount of horse sense is not equally divided, which makes a mixture not hard to explode, and when exploded, hard, to suppress. I met a pair of this kind recently. The horse, like myself, though there were more brains wanted in the buggy, for he turned around squarely, breaking the shafts, and put both fore feet in the carriage. It took some time for the driver to recover his composure and dispel his wife's alarm. Incidentally we repaired the broken buggy with the tools in that ever handy tool box, and the driver went his way in better humor than when we first met. Numerous experiences of this kind are what the driver gets in any rural locality. Many queer questions are asked. One individual wanted to know if "them big tires was what made it go." Another, when showed the engine, wanted to know where the spring was that ran it. When informed that it ran by explosions, he said: "Gosh, it's a wonder it don't bust."

—Yours, etc., A. AUBLE, JR.

#### Beware of Heavy Oil

Abany, N. Y., Feb. 3.—Editor MOTOR AGE: I am using a gasoline automobile and find that if I have clean points on my sparking plug and a good adjustment of trembler I have a good spark, and with a fairly good quality of gasoline my machine will always go. One thing that automobile users, especially those using gas engines, ought to be careful of, is to see that any can in which gasoline for their machine is put, is free from any other kind of oil. A new can or one that has never been used for any other purpose should be used, as a very small quantity of oil in the gasoline will cause a great deal of trouble once it has got into the gasoline tank of the automobile. Have never had this trouble myself, but have seen others who have.

—Yours, etc., E. W. LEAHY.

#### Dealers and the Makers' Association

WASHINGTON, D. C., Feb. 17.—Editor MOTOR AGE: We note with interest your article in the MOTOR AGE of February 13, relative to our coming automobile show. We desire to correct any impression that may have been formed that the organization we propose to promote is to be antagonistic to the National Association of Automobile Manufacturers. On the contrary, we appreciate the necessity of co-operating with manufacturers to insure the best results from our organization. We feel, however, that the Association of Automobile Manufacturers have made a mistake in their arbitrary ruling relative to the show question, which amounts practically to a boycott on all shows except New York and Chicago. This boycott would have been successful in Washington had not the independent manufacturers and the local dealers appreciated the advantage of a local show and de-

termined to hold a show regardless of the support or antagonism of the National Association of Automobile Manufacturers. We have had one show and the benefits resulting therefrom were large, not only in the way of actual sales, but we received column after column of newspaper notices in all of the Washington papers, which could not have been purchased or secured under other circumstances.

The success of our exhibition is already assured and the contracts we have received from outside manufacturers during the past week are indeed surprising, even to us. We have the active support and interest of practically all of the automobile owners in this city, and we are determined to have a show second only to the large shows in Chicago and New York.

We feel that there should be much higher objects by both the National Association of Automobile Manufacturers and the National Association of Automobile Dealers than the regulating of show matters, and, in our opinion, it should be left to the discretion of every manufacturer or dealer to exhibit at a show or not, as they individually see fit, as this is a question of advertising pure and simple, and we think that every manufacturer or dealer should have backbone enough to place his own advertising where he feels it will do him the most good, without using the name of any association as a shield. We know of no other well organized trade or manufacturing association that dictates to its members how they should place their advertising, and there are many large and successful manufacturers in other lines who encourage shows in their respective lines, and have done so for over 50 years in this country, and if this is necessary in such staple articles as food, etc., it certainly can be beneficial in educating the public to such a practically new product as the automobile. We admit that the show business was overdone last year, but the manufacturers must remember that this would not have been the case if their advertising men in placing their advertisements had been inspired from business motives and not from antagonism or jealousy. Furthermore, few manufacturers last year were in position to fill orders for the goods they sold at the shows in which they exhibited. If you will excuse the simile, we think it unnecessary to condemn food or drink as a whole simply because an overdose of same may disagree with some individuals.

We desire to thank the MOTOR AGE for its fair and business-like treatment of this and all other trade matters, and beg to assure you that you have our hearty good-will.—Yours, etc., WASHINGTON AUTOMOBILE DEALERS' ASSOCIATION, Winfred J. Foss, Treasurer.

#### Questions About Motor Efficiency

Iowa City, Iowa, Feb. 19.—Editor MOTOR AGE: Is there a single cylinder, double piston motor built in the United States similar to the Gobron-Brillie of France? and are there any double opposed cylinder motors in which the cylinders are fired together, to make them explosively balanced? About what difference would there be, if any, in the



power received from two 5 horse power motors of the above type, one being water cooled and the other air cooled? What would you advise in the way of a motor of 5 or 6 horsepower for automobile use—a single cylinder upright or a double cylinder opposed, horizontal?—Yours, etc., E. D. Carr.

Experiments have been made with motors of the single cylinder, double piston type, but they have never been made commercially practical so far as we are informed.

All double cylinder motors of the opposed type can be arranged to provide power impulse in both cylinders at the same time and thereby explosively balance them, as well as having them mechanically balanced, but this is not advisable, as it necessitates a heavier shaft in the motor to withstand the shock of combustion. The application of power at each end could be arranged provided the power of each were reduced by lessening the compression, but that is not possible if the full power of the motor and its charge are to be utilized. When high compression is used and both cylinders are fired at the same time, the power exerted on the shaft to revolve the flywheel, which, in this case, must be heavier than usual, would twist the shaft and most likely throw it out of line to such an extent that it would be useless. The double cylinder motor of the opposed type is more satisfactory when set to give a power impulse each revolution of the cranks, first in

one cylinder and then the other. As the speed of the motor is increased the vibration is lessened and eventually becomes but a tremor in comparison with that set up by a single cylinder engine, balanced on the cranks or flywheels. Then again, it gives more steady application of power and runs far more steadily than it would if both cylinders were fired at the same time.

The difference in power between the two engines described would be less a matter of power developed in combustion than the length of time they would operate under a given load and maintain their rated power. If the cylinders being of practically the same construction, compression, stroke and bore, each combustion should develop the same power, but the question is how long the lubrication in the air cooled motor will last. Under certain conditions the air cooled motor will prove satisfactory, but in engines of 5 actual horsepower it is a difficult matter, if not impossible, to keep the temperature below the burning point of the lubricating oil. The water cooled engine can be maintained at a temperature which practically eliminates the difficulty mentioned, but the matter of lubrication is of just as much importance and should be watched just as carefully as in the air cooled type. An automatic oil feed, operated by the engine and so regulated as to provide just the right quantity of oil during each revolution while the engine is running, is the correct form of lubrication and will give greater life

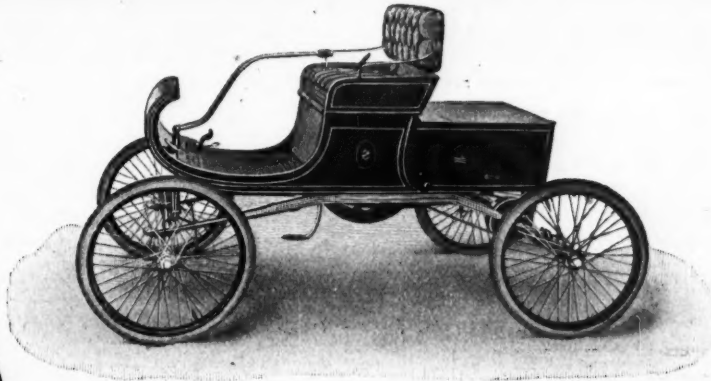


INTERIOR VIEW OF THE HAYNES-APPERSON MACHINE ROOM.

Claiming to be the first manufacturers of gasoline automobiles in the United States, the Haynes-Apperson Company might, with perfect truth, claim to have one of the largest and best appointed factories as well, despite the number of great concerns which have come into existence in the last few years. So far as its magnitude is concerned some impression may be gathered from the accompanying picture of the machine room. The factory consists of two buildings, each of two stories,

and, as the picture shows, of immense length. The company's record is one of uninterrupted success. It commenced making machines in 1893 and has since taken part in every event of importance without once meeting defeat by machines in the same class. It has been the Haynes-Apperson policy to take part in contests with stock machines and not to erect special ones for competition. The Haynes-Apperson is probably as popular in Chicago as in any city in the country and will be one of the attractions of the show.





## THE OLDSMOBILE

PRICE \$650.

Here you get perfection in Automobiles.—The pioneer and the best.—Most flexible in handling—absolutely under full control of the operator. No complicated devices—Simplicity in design with strength in construction. Rough roads, muddy roads, snow, frost or ice have no terrors for the Oldsmobile. Odorless, Noiseless, Safe. Write for illustrated book. ♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦

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**FEATURES:** Grooved pins and forced air system for cooling the engine. Folding front seat, facing forward, for extra passengers. Entire rear of the body for carrying purposes. Very safe, due to its simple control, two foot brakes and one double acting hand brake. Extremely easy riding, due to its long flexible side springs, with swiveled ends. A great hill climber and very speedy, due to its powerful eight-horse power engine.

An Ideal Doctor's Vehicle. Price, \$1,000. With Top, \$1,100.

**KNOX AUTOMOBILE CO., Springfield, Mass.**

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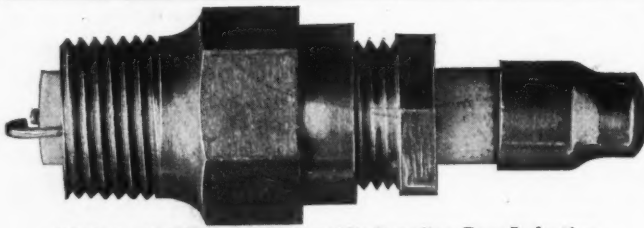
The management of the Chicago Show can arrange for the disposition of the services of a number of bright salesmen during and for a few days prior to the exhibition. Those who have a reasonable acquaintance with automobiles preferred, and must, in any event, be able to talk intelligently on the subject after a few hours' instruction.

Apply, before February 25, to L. FEST, at the office of MOTOR AGE, 324 Dearborn street, Chicago, or after that date at the Coliseum.

"Ask Dasey" about Electric Ignition (Jump Spark) & Automobile Supplies in General

## THE DASEY PORCELAIN SPARK PLUG

The old one was GOOD—the new one (see cut) is the highest attainment in the art of plug manufacture. Cheap plugs are dear at any price. In the Dasey every element of cheapness is eliminated. It is designed scientifically and upon lines not to be found in any other plug made, hence its success. :: :: :: :: :: :: ::



Write for Catalogue of Automobile Supplies, Dow Induction Coils, Batteries, Etc.

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Advertising counts but results speak louder than printers ink. Be convinced at the cost of \$1.75 for a single plug. 14c extra for registration and mailing. Discounts in dozen lots. :: If you want Mica plugs, the new Dow plug in 1/2 inch and Metric thread sizes is the best in the world at \$3.00 each. ::

## New Kelly Generator...

For Steam Vehicles  
Improved—Perfect in Every Way



Drip cup unnecessary in starting—Aluminum case over generator—All connections on the outside—Strongly made—Easily adjusted—No flaring or flashing in lighting, even in strong wind. A quick and powerful generator—Main fire valve controlled at seat—Small and neat in appearance and adapted for any machine.

Our new One-Piece Cast Burners have been greatly improved both in power and strength. No wedged tubes in its construction. All in one piece and easily cleaned.

Address, **KELLY HANDLE BAR CO., Cleveland, O., U. S. A.**

to the engine than the drip feed so commonly used. In one case the oil is fed according to the requirements of the engine and in the other the feed is constant, regardless of the speed at which the engine is running, thus allowing too much oil at one time and not enough at another.

Choice between the vertical and double cylinder opposed horizontal engine is more a matter of convenience to the individual than anything else, provided vibration is disregarded. In the vertical single cylinder the wear is more evenly distributed around the piston and cylinder walls, but is felt on the side of the cylinder opposite to that at which the crank receives the thrust. In the double cylinder horizontal, opposed, the pistons bear on the lower side of the cylinders, but the wear is not the same in each owing to one impulse being given when the crank is rising, thus tending to force the piston down in the cylinder developing the power, while on the next impulse the crank receiving the impulse, being on the downward throw, causes a tendency in the piston to rise, thus relieving the wear on the lower side and causing the strain to be felt on the upper side of the cylinder. While this is the theoretical side of the argument, the matter is one that depends a great deal on the construction of the motor, length of cranks, connecting rods, length of pistons and other features, all of which play a part in the life of the motor. The double cylinder motor, however, is preferable owing to its operation being accomplished with less vibration and also because power is developed at each revolution of the crankshaft.

#### Home Trainers for Cycle Clubs

San Francisco, Cal., Feb. 10.—Editor MOTOR AGE: This club will feel thankful for suggestions concerning the construction of a home trainer for bicycles to be used in our gymnasium. Suggestions or plans as to construction and parts, materials for same, etc., will be most acceptable. If possible kindly put us into communication with manufacturers of trainers and clubs using them that we may be able to get the best to be had.—Yours, etc., California Cycling Club, C. L. McEnerney.

One form of home trainer that has proven satisfactory is that in which three rollers are used, these being 2 to 3 feet each in length and 10 to 15 inches in diameter, and arranged two in the rear about 20 inches apart, or sufficiently apart to allow the rear wheel of a bicycle to drop sufficiently below the top of the rollers to prevent the wheel riding over the front roller. The front roller should be placed so that the center of same will be an inch or so ahead of the wheel axle to assist in overcoming the tendency of the machine to move ahead when in motion. In order to get best results the rollers should be mounted on ball bearings, although for training purposes it will make the work more real to run the rollers on plain bearings. The front roller is connected to the front rear roller by means of a belt, in order that the front roller may turn at the same speed as the rear, and thus give practically the same

results as though the wheels were passing over the ground. The rider needs no assistance to maintain an upright position, that being accomplished exactly as in riding on the ground. The rollers must, of course, be mounted on a frame set high enough to allow the rollers to clear.

#### Two Brakes, But Both Useless

Akron, O., Feb. 20.—Editor MOTOR AGE: Last fall I was on a paved street and came to a long, steep hill on which were double street car lines and much traffic. As I started down the hill I noticed that the brake which I usually use did not work, and looking down the side of the vehicle saw that the chain was off the sprocket. Still I was not alarmed, as I had an emergency brake, although it had not been used for some time. On trying it I found that it had become so worn as to be useless. To make a long story short, I took a very fast ride, dodging teams and street cars until at last the machine came to a stop some distance up the next rise. The lesson to be learned is to not wait until needed, but see that the brake is right when the need is not so urgent.—Yours, etc., G. G. Crawley.

#### To Prevent Frozen Connections

ANN ARBOR, Mich., Feb. 20.—Editor MOTOR AGE: Owners of steam machines are all, I presume, more or less troubled with their steam gauge connections freezing, due to the distance at which they are mounted from the boiler and lack of circulation. I have overcome this in my own case by putting in a T connection just below the steam gauge and attaching an ordinary nick-eled radiator drip cock. This does not detract from the appearance of the equipment and by allowing a slight drip or by blowing off the cock now and then the gauge and all connections may be heated up to boiler temperature. This is not, perhaps, a new idea but I have not, as yet, seen another steam machine so fitted.

Practically my only mishap during the season was the overheating of my boiler, necessitating the re-rolling of some tubes. The cause of the accident was the working under a loose fitting water glass of a piece of rubber packing. As I had no blow-off cock at the bottom of the glass (which, by the way, all water glass fittings should be required to have) I ran serenely to my "finish" with a half glass of water and no means of detecting the sham.—Yours, etc., HOWARD E. COFFIN.

#### Power Required in Light Vehicles

MANKATO, Minn., Feb. 20.—Editor MOTOR AGE: What style of gasoline engine would you recommend for use in a machine weighing from 700 to 1,000 pounds on the roads of Minnesota?—Yours, etc., H. F. PERCIVAL.

A motor of the opposed type, cylinders about 4x4, should develop about 4 horsepower at 750 revolutions and would be suitable for a machine of from 700 to 1,000 pounds, unless great speed is required, when a more powerful motor would be needed. For anything over 1,000 pounds, nothing less than 7 horsepower is advisable.



## RECENT ISSUES FROM THE PATENT OFFICE

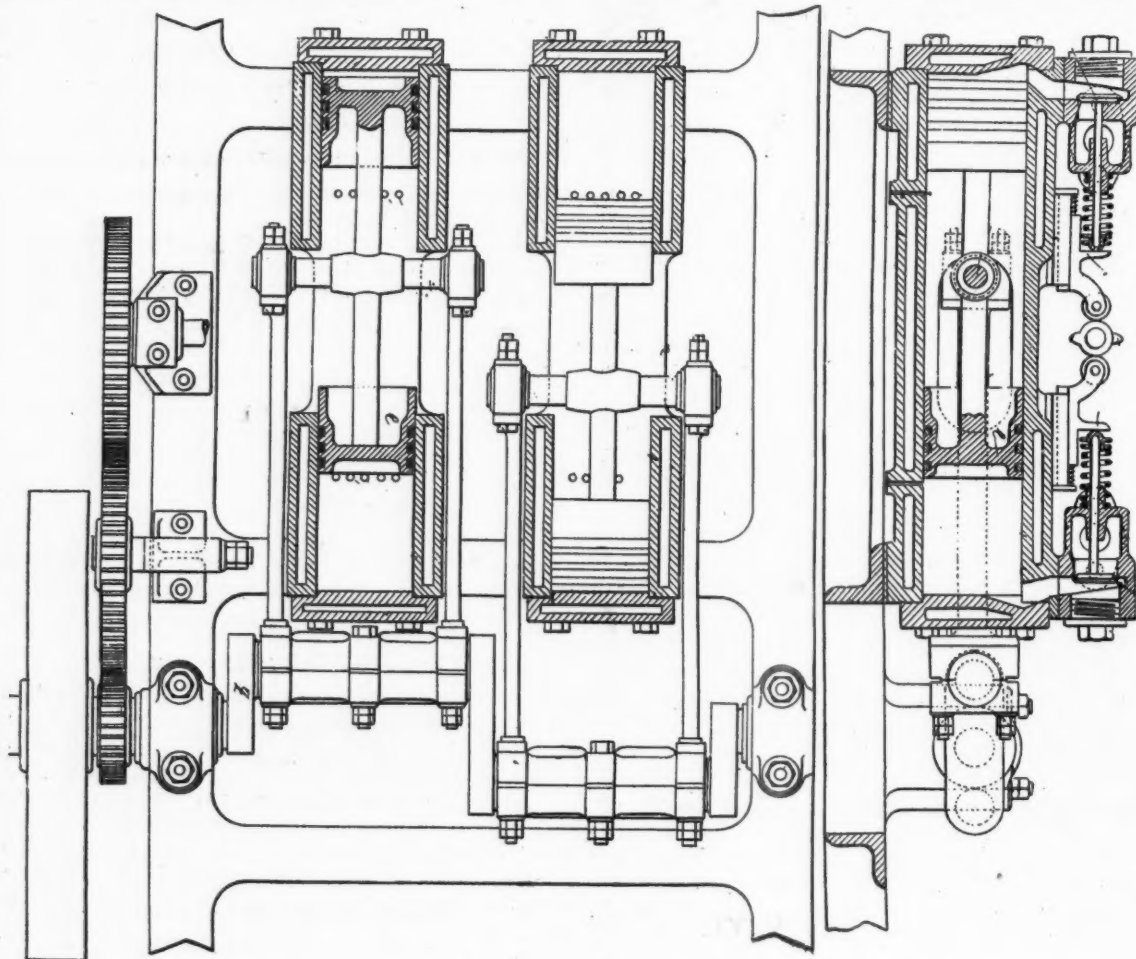
Charles E. Calloch, of La Fleche, France, is the patentee of a light motor carriage, the noteworthy feature of which is without question the motor, though several good features are embodied in the general construction, one of which being the frame construction. The motor and transmitting mechanism are mounted on an auxiliary frame which may be readily removed from the major portion of the vehicle when repairs may become necessary. The motor is of the four-cycle type and comprises four cylinders arranged in parallel tandem pairs. Each tandem pair is cast in one piece with the heads bolted on in the usual manner. The central portion of this casting, between the cylinders proper, is open at the sides to allow passage of the cross heads to which the connecting rods are pivotally attached. The cross heads are secured to the center of the piston-rod which extends from one piston to the other as shown in the illustration. The motor thus has four pistons working alternately in two double tandem cylinders. The heads of the connecting rods are journaled to the motor shaft, which comprises two cranks set at 180 deg. The advantages claimed for this style of construction are the lack of stuffing boxes, usually found in tandem engines, and the increased length of the connecting rods. The valve chambers are secured to the upper side of the cylinders and the valves are located side by side with their stems toward the center of the double cylinders. Screw caps are seated in the outer face of the valve chamber and by their removal the valves may be inspected or removed. The admission valves are of the poppet type and act automatically. The exhaust valves are controlled by four cams on a transverse shaft, located over the center of the cylinders and rotated by suitable gearing from the motor shaft in the proportion of one revolution of the former to two of the latter. The cams act directly on the valve stems through the media of four guide rods slidably mounted on the top of the cylinders. A novel and probably somewhat noisy feature is

the introduction of a number of perforations in the lower portion of the cylinders near the extreme outer position of the face of the piston and communicating directly with the air, whereby at the end of each suction stroke pure air at atmospheric pressure is drawn into the cylinder and mixes with the vapor previously admitted. At the end of the explosion stroke the same passages serve to relieve the pressure in the cylinder by allowing the escape of a portion of the burned vapor during the momentary hesitation of the piston while the cranks are passing the center. If electric ignition is employed the timing mechanism may be located on the transverse shaft above described.

## Lemp's Automobile Patents

One of the most, if not the most, extensive issues of motor vehicle patents ever granted to one man by the United States patent office was recently made to Herman Lemp, of Lynn, Mass., the issue of February 11 containing thirteen patents granted to him. Of these, eleven are assigned to Elihu Thomson, of Swampscott, Mass., and two to the General Electric Co., of New York. Of these patents eight cover steering devices, two controllers for electric vehicles, two brakes and one a motor support shown in connection with a steam engine. The steering devices are all designed to prevent reaction under the influence of obstructions met in the road and some of them are over-complicated. Six of the devices shown are based on the displacement of a normally quiescent fluid contained within a sealed chamber, in which a part of the device moves; when in action, one is positively locked by a pair of pawls and the other is held against reactive movement by a friction device comprising an expansible ring or annulus within a cylindrical chamber.

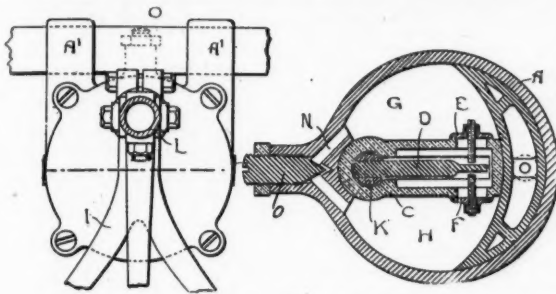
There is a decided similarity in the fluid controlled devices and the dates of the applications covering them, ranging from July 15, 1898, to June 28, 1901, show a gradual development of the same fundamental principle. The development did not, however, run in the direction of simplicity,



CALLOCH'S ENGINE.

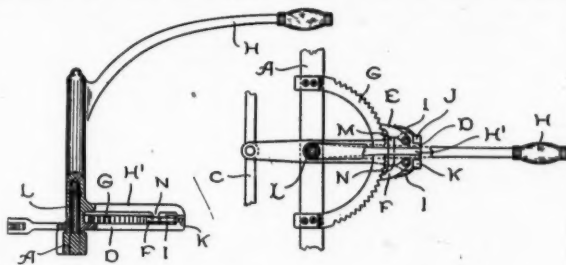


as the last is by far the most elaborate and complicated of all. One of the latest, the application being dated Jan. 17, 1901, is not unnecessarily complicated and embodies the principles of its predecessors with some improvements thereon. Referring to the illustration, A represents a casing which is



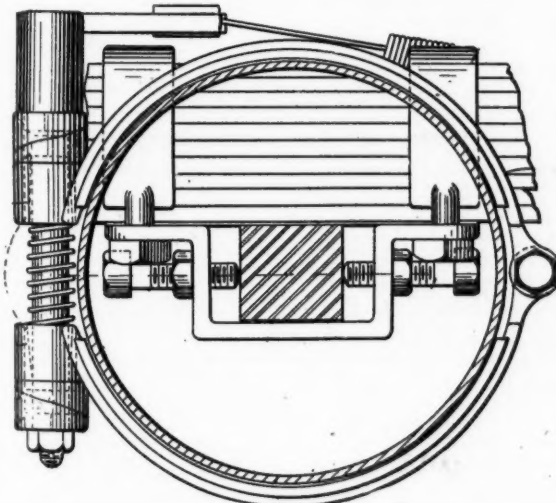
Lemp's Fluid-Controlled Steering Device.

arranged to be secured to the axle by means of clamps A'. Mounted eccentrically for movement within the casing is the piston C. This piston consists of a box-like structure having an actuator D mounted therein. On the outside of the piston are two valves E and F, which control the passage of a normally quiescent fluid contained in the chambers G and



Another of Lemp's Steering Mechanisms.

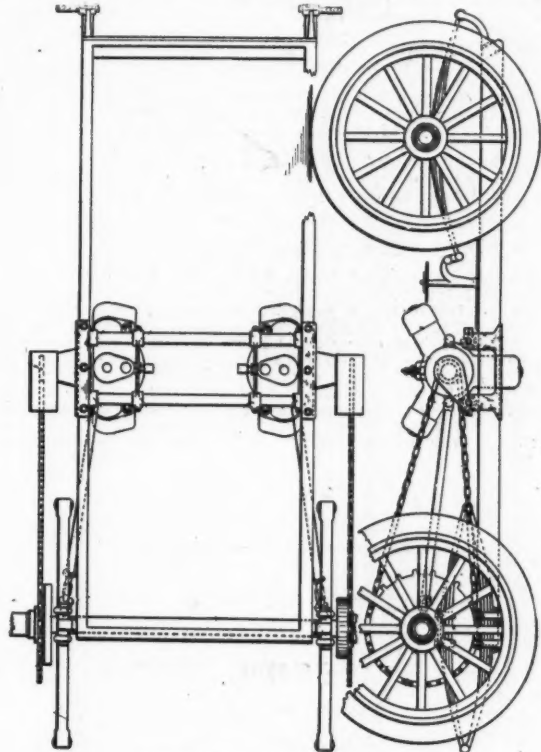
H. These valves are each provided with pins or projections, which engage with the actuator D when the latter is moved from its central position. When the actuator is thus moved to one side or the other from the central position shown in the illustration the valve in the direction of movement is positively opened and the fluid in passing from one chamber to the other opens the other valve. As soon as pressure is removed from the actuator the valves close, due to gravity or means provided, and the piston is held in place. The piston is provided with an upwardly extending sleeve or shoulder to which is secured the triangular frame I, and the latter is



One of the Lemp Brakes.

secured to the steering knuckles by links in the usual manner. The actuator is rigidly secured to the manually controlled steering lever by means of a pivot coupling which allows a vertical play of the lever. In order to avoid an undesirable degree of rigidity a by-pass N is provided, through which the fluid may pass from one chamber to the other, the freedom of its flow being regulated by the needle-valve O.

The principal points of difference between the device described and the others of the same type lie in the construction and methods of operating the valves. The most simple of all the steering devices is one wherein reaction is prevented by the action of a pair of pawls operating with a toothed segment secured to the front axle. Pivotaly secured to the axle, concentric with the toothed segment, is a lever D. Pivotaly secured to this lever are the pawls E and F, oppositely disposed with relation to each other and held in engagement with the segment G by springs I. In addition to the pawls the lever D has two stops J and K, the former acting when the handle is moved in one direction from a central position and the other when the handle is moved in the opposite direction. The steering handle H and the lever D are mounted for oscillatory movement on the stud L,



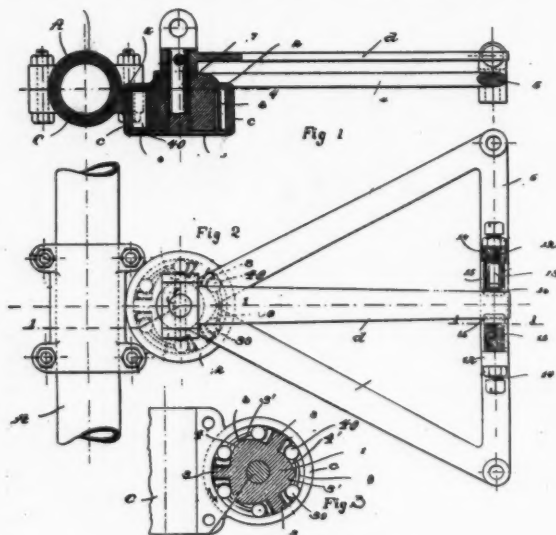
Lemp's Supporting Mechanism.

which is rigidly secured to the axle A. Moving with and rigidly secured to the handle H is an arm or actuator H', that extends outwardly from the hub of the handle and passes between the stops J and K, a certain amount of lost motion being permitted between them. This lost motion is utilized in releasing the locking device prior to any motion of the steering wheels. Mounted on the actuator H are two pins M and N. The pin M is arranged to move the pawl F out of engagement with the ratchet G when the actuator is moved from a position of rest into engagement with the stop J and the pin N performs the same office for the pawl F when the handle is moved in the opposite direction. With this arrangement it will be seen that the first office of the handle is to release one of the pawls from engagement with the ratchet and then move the wheels through the lever D and the connecting rods. The two brakes covered in these patents are extremely powerful, in fact, if the vehicle had any considerable momentum when the brakes were applied the wheels would have to be extremely strong to stand the strain. One is simply an expansible ring clutch comprising an annulus secured to the wheel, within which works an expansible ring secured to the axle. The ring is provided with a vertical arm, with a hub at its center whereby it is secured to the axle. The ring is split at the under side and within the opening is the spreader, which is secured to a shaft, rotatably journaled, one end in a lug attached to the arm or support of the ring and the other in a hanger attached to the axle. An arm is attached to the shaft whereby the

spreader may be oscillated within the split in the ring and the latter expanded within the annulus secured to the wheel. The other brake is of the compression type and the annulus on the wheel is adapted to receive the brake on its outer periphery. The brake band is made up of two separately movable parts pivotally secured at one end by a transverse bolt. The upper half of the brake band is provided with an extension by which the entire brake is secured to the vehicle frame, preferably to the lower part of the body supporting spring. Each part of the band terminates in a head having a spiral cam surface, the cam surfaces on the two parts being oppositely disposed. The heads are bored centrally, and passing through the holes is a shaft which is provided with cams, rigidly secured thereto and arranged to engage with the cam surfaces on the heads. Located between the heads and surrounding the shaft is a spiral compression spring for separating the parts of the brake band and thereby releasing the brake. Secured to the upper end of the shaft is a lever for operating the brake and a spring is provided by which the lever is pulled back into the position of release when the pressure on the foot lever is relieved. In connection with the motor supporting device a three-cylinder single-acting steam engine of the brotherhood type is shown and the arrangement comprises a rectangular frame, preferably of wood, supported on four springs. From the center of the longitudinal side members of this frame depend two hangers, to which are secured two transverse tubes. Attached to the frame of the engine are lugs adapted to embrace the tubes and thus form the supports of the engines, of which there are two, one at each side of the frame, and each driving one of the rear wheels, which are journaled on a rigid axle and as the engines are independent of each other the differential gear may be done away with. To provide for the regular tension of the chain, radial distance rods are placed between the engine frame and the rear axle.

### Persson's Steering Device

Otto F. Persson, of Lynn, Mass., who has devoted considerable attention to the improvement of automobile construction, has recently designed a steering apparatus that is nonreactive yet simple in construction. The present invention comprises a rapidly acting, sensitive and powerful means of locking the steering member at any point in its path of movement, while at the same time the slight power required to move the controller instantly releases the locking means and maintains it released until the steering lever has assumed its new position. In the drawings, Fig. 1 is a part section on the center line of Fig. 2. Fig. 2 is a plan view



Persson's Steering Device.

showing the triangular member to which the connecting rods running to the steering knuckles are attached. Fig. 3 is a detail showing the locking device. A clamp collar C is secured to the front axle near its center. Rigidly secured to the clamp collar C is an annular member C which forms a part of the locking means. Within this ring and movable relatively thereto is a cam member 1, which has at its upper end a laterally extending flange 2, which rests upon and is supported by the upper face of the annulus c. The periphery of the member 1 is provided with three projections 3, which extend substantially to the inner circumference of the fixed member c. The periphery of the member 1 between said pro-

jections is divided into pairs of opposite cam faces 3' 4', to co-operate with pairs of hardened steel locking dogs shown as rolls 30, 40, interposed between the members c and 1. Small U-shaped springs tend to move the roll of each pair toward each other and by reference to Fig. 3 it will at once be seen that ordinarily rotative movement of the member 1 will at once be resisted by the edging of one of the rolls of each pair, the locking means acting as a friction clutch. The movable member 1 has a rigidly attached radial arm 4, which is in the form of a triangle and has at the outer end a connecting arm 5 and at the outer apexes of the triangle are pivotally connected the links leading to the arms of the steering knuckles so that a rotative movement of the member 1 will correspondingly change the position of the steering wheels. As shown in Fig. 1, a disk 6 is applied to the bottom of the member c, a stud on the disk extending upward through a suitable hole in the center of the member 1, entering and being secured to the hub of a radial arm d. The disk 6 is provided with upturned projections 8, segmental in form, which enter between the members c and 1 and are interposed between the several pairs of locking dogs or rolls 30, 40. The method of operation is as follows: If the disk be rotated in the direction of the arrow in Fig. 3 the projections which constitute the releasing devices will press the rolls 40 against their springs into inoperative position, unlocking the member 1, which can then be rotated in the same direction, while the reverse movement of the disk renders dogs 30 inoperative, and the member 1 can be turned in the opposite direction. The radial arm d is provided at its hub with upturned lugs or ears, between which the controlling lever is pivotally mounted, and it is obvious that the action of the controller will be transmitted through the stud to the disk 6 as described. The cross-bar 5 is provided with transverse lugs 12 at opposite sides of its center to receive headed studs 13, threaded for a portion of their length at 14 to engage threaded holes in the lugs, sleeves 15 sliding loosely on the inner ends of the studs and having notched heads 16, receive between them the arm d. Springs of equal strength are interposed between the heads and the lugs to normally center the arm between the lugs with the projections 8 in mid or inoperative position, the sleeves 15 having longitudinal play on the studs. When the controlling lever is swung laterally the arm d moves therewith till contacting with one of the stops 15, the locking means having been released as described, and thereafter the arm 4 will be moved in unison with the controller. As soon as the pressure upon the controller is relaxed the arm 6 will be centered relatively to the arm 4 by the springs thereon, and the locking dogs will instantly become operative and the steering wheels will be locked positively in their new position and maintained in such position till the controlling lever is again manipulated as described.

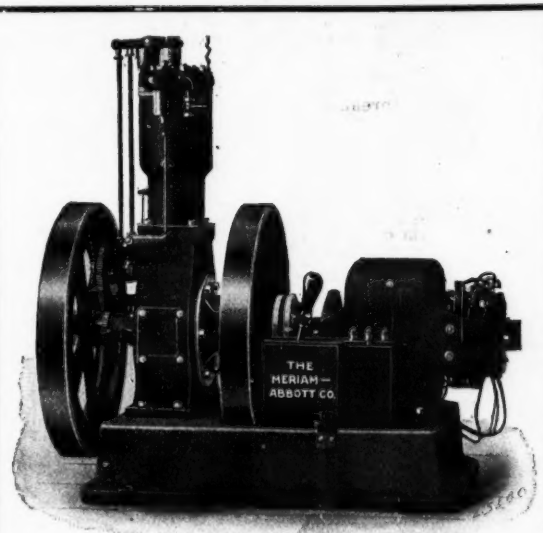
### Novel Boiler Feed Regulator

A boiler feed regulator designed by William L. Tobey, of Winthrop, Mass., has several novel features. The apparatus is not only a feed regulator but embodies a steam condenser and feed water heater. The exhaust steam is carried from the engine to a condensing apparatus, preferably located on the dash and under the footboard of the vehicle, which consists of a series of long, flattened tubes or conduits, the said tubes being alternately connected first at one end and then at the other side of the vehicle, whereby the exhaust steam discharged thereinto is caused to travel a considerable distance through tubes exposed to the air. These tubes being flattened in cross sections cause the steam passing through them to be spread out into a wide, thin body, the more easily to give off its contained heat and bring about a quick condensation of the steam. To present a maximum effective area to the action of the air the tubes are arranged obliquely, one slightly overlapping the other. After passing through the condenser above described the exhaust, whether or not wholly in the form of water, is discharged into a hot well or receptacle, where it is further cooled and condensed. To facilitate this further cooling within the well the latter is provided with cooling ribs or flanges which increase the radiating or cooling surface of the well. From the bottom of the well a boiler feed or supply pipe leads to the inlet or supply port of a suitable pump and the outlet from this leads to the boiler. The pump has a second source of feed through a pipe leading from the usual water supply tank carried in the vehicle body. Any uncondensed steam within the well is allowed to escape therefrom through a pipe discharging into the exit or smoke flue of the boiler. The supply of feed water from the tank is regulated by a valve in the supply pipe, shown close to the tank. The stem of this valve is provided with a collar, beneath which is arranged the forked end of a lever fulcrumed upon the side of the tank or other suitable support. The short end of the lever is connected by a link with a cap connecting and finishing communication between the free ends of two tubes the opposite ends of which enter the boiler. These pipes are shown connected with the boiler above and below, respectively, the water line which is indicated in the illustration by a dotted line. The two tubes are of metals having different coefficients of expansion. For example, the upper tube is of brass and the lower tube is of iron. The iron tube is intended to be always filled with water, that is, the water level is supposed always to stand above this tube, while the brass tube is filled with water or

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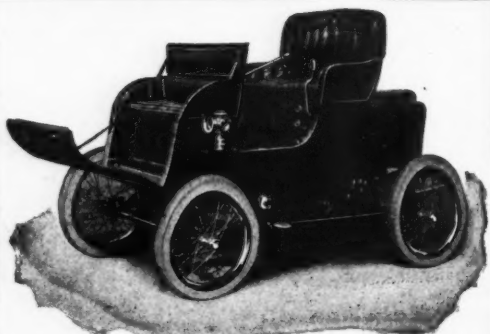
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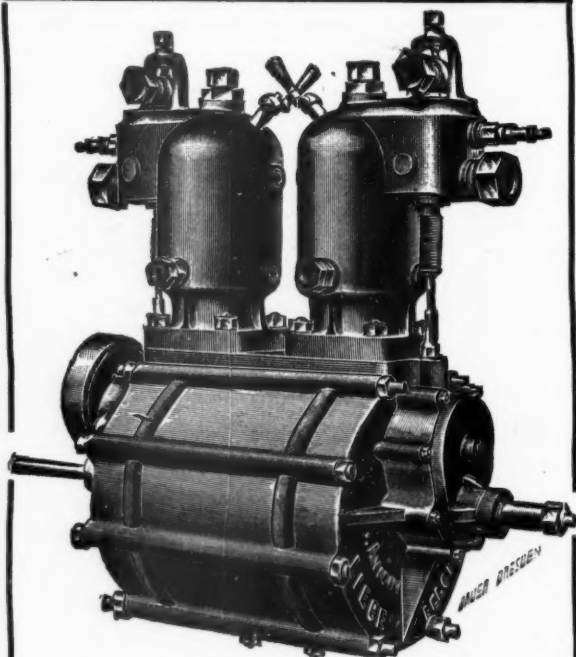
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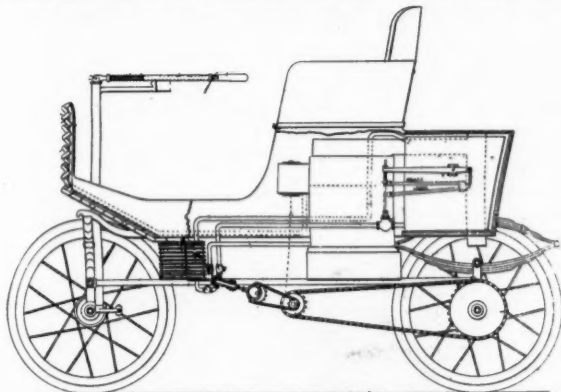
:

NEW YORK





steam, according to the level of the water in the boiler. When the water level rises and fills the upper tube the latter contracts and shortens relatively to the under iron tube, thereby raising the before-mentioned cap, causing the short arm of the lever to be raised and the long end depressed, the latter acting on the valve stem and closing the valve, which cuts off the supply of feed water from the tank to the feed pump. A spring on the valve stem takes up any excess of movement of the lever with reference to the valve seat, thus avoiding possible injury thereto. The valve remains closed as long as the condensation from the exhaust steam

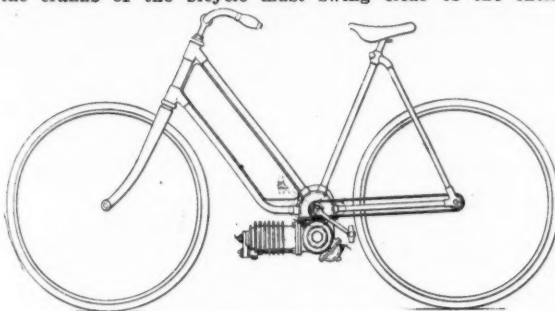


Tobey's Boiler Feed Regulator.

enters the well in sufficient quantity to supply the pump with the water needed to maintain the water level in the boiler; but the moment this supply becomes inadequate the water level will fall below the brass tube and permit steam from the boiler to enter it and by reason of the excessive latent heat that it contains, as compared with the water, cause the tube to expand and lengthen rapidly in relation to the iron tube, and will thereby depress the cap upon the ends of the tubes. This causes the lever to raise at its outer end and open the valve, permitting the pump to draw water from the supply tank.

#### A Drop Frame Motor Cycle

There are several drop frame motor cycles on the English market, but so far none in this country except perhaps the Werner, which has the motor attached to the front fork immediately over the front wheel. Anticipating the demand for such a machine, Edwin S. Strickland, of Bound Brook, N. J., has designed a motor cycle in which the motor is carried below the bottom bracket, thus allowing the frame to be of any desired pattern. There are several marked features to this machine, probably the most noticeable being the use of a two-cylinder motor. This motor possesses a number of novel features, the only objectionable one being that, in the position shown, it necessitates an excessively wide tread, as the cranks of the bicycle must swing clear of the entire



Strickland's Drop Frame Motor Bicycle.

motor. In place of the usual crank bracket a gear case is built into the frame and the crank shaft passes through and has its bearings in the sides of the case. Surrounding the crank shaft is a sleeve which extends through the case on one side and carries a sprocket, by which the rear wheel is driven when the motor is in use. On the center of this shaft is a spur gear, in mesh with a pinion on the motor shaft. This gear is not rigidly secured to the sleeve, but has a flexible connection therewith. This gear case is open at the bottom and bolted to it is the crank case of the motor, which case also contains the ignition gear. It is stated by the inventor that he prefers a two cycle motor, as he thereby

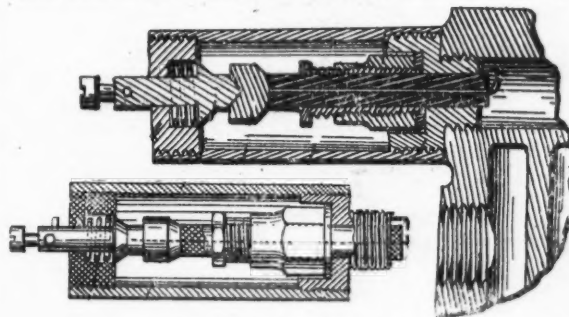
obtains a power stroke at every revolution of the shaft and the cam shaft of the igniter is timed to be the same as the motor shaft, but his drawings show an exhaust valve and an operating cam thereon on the same shaft, which leaves one in doubt, as this valve would be entirely unnecessary in a two cycle motor and is speeded wrong for a four cycle type. Another point in which the designer is liable to have many troubles is the absence of flywheels, as he is depending on the explosion in one cylinder to overcome the compression in the other.

#### Spring Suspended Battery Tray

William Bowker, of Waltham, Mass., has designed a frame work for an electric carriage, with the object of providing a construction in which the battery platform or tray will be supported entirely independent of the vehicle body. This is accomplished by supporting the body on springs of any preferred form and extending the side members of the frame somewhat to the rear of the rear axle and supporting the ends of two semi-elliptical springs from these side members so that the springs lie transversely of the body. The battery platform is supported on the center of these springs so that the batteries are entirely within but in no way connected with the body.

#### Boisselot Sparking Plug

Jean B. Boisselot, a French engineer who has been granted a number of patents on gasoline engines and accessories, has designed a sparking plug in which particular attention is given to the avoidance of breakage by accident. It consists of a cup shaped base, to be screwed into the motor head and carrying one of its sparking terminals in circuit with the motor frame work. Passing through this is a porcelain rod which acts as an insulator for the other terminal. Secured



Boisselot Sparking Plug.

to the cup shaped base is a tubular extension which covers the portions of the plug usually exposed. In the outer end of this tube is a plug of non-conducting material, through which passes the binding post. A marked feature of the device is that the binding post is separate from the insulated portion of the plug and is held in electrical contact therewith by means of a spring which bears against the non-conducting plug in the end of the tube. Thus it is maintained that the danger of accidental breakage is largely avoided.

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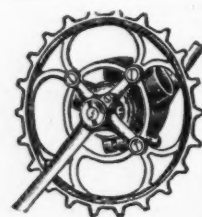
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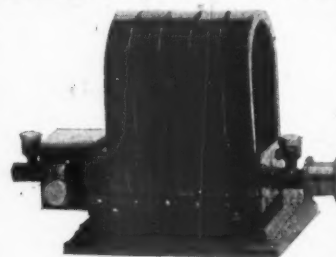
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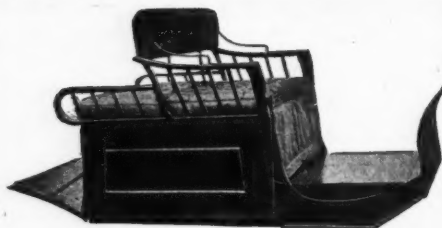
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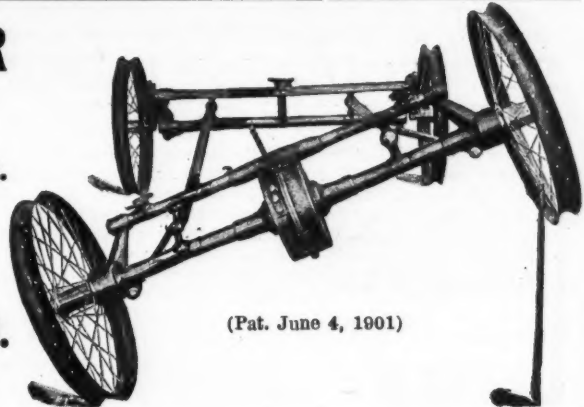
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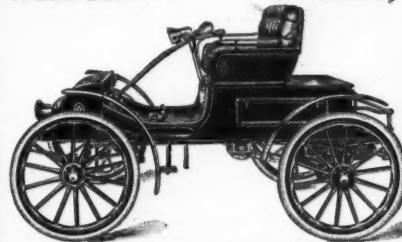


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| 5 1/2 x 3 x 8 1/4     | 45c            |
| 5 1/2 x 3 x 9 1/4     | 55c            |
| 5 1/2 x 3 1/2 x 9 1/4 | 55c            |
| 5 1/2 x 4 1/4 x 9 1/4 | 55c            |
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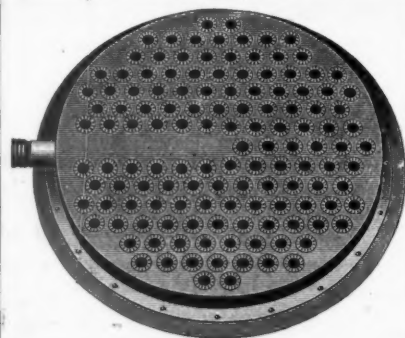


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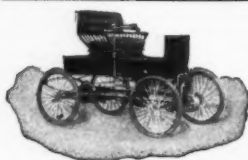
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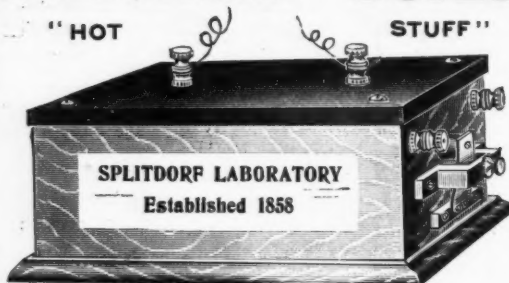
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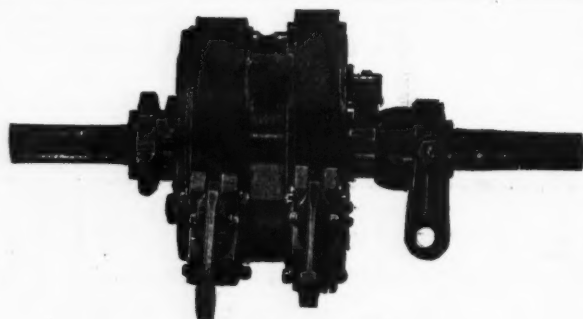
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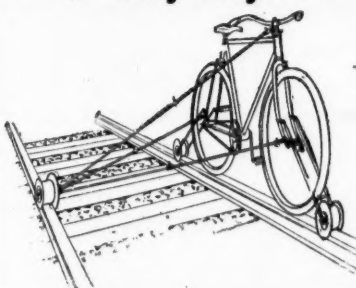
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